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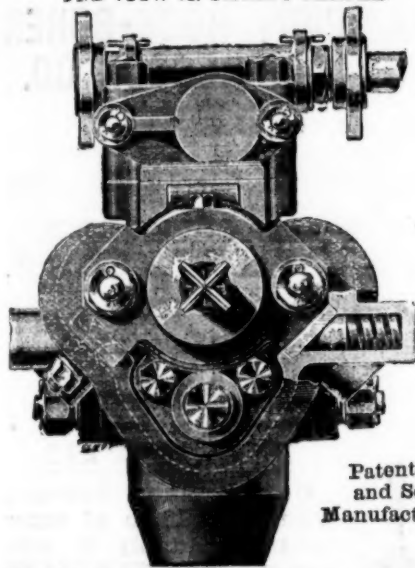
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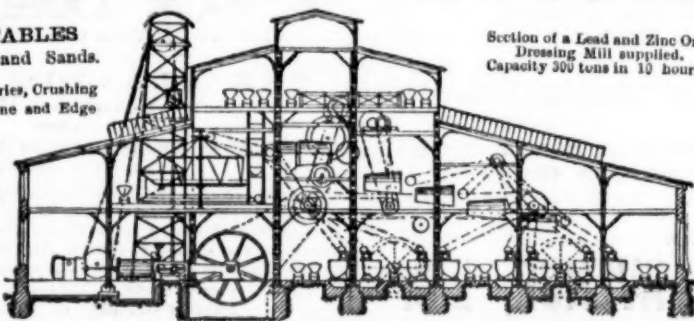
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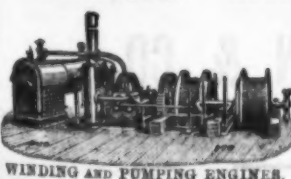
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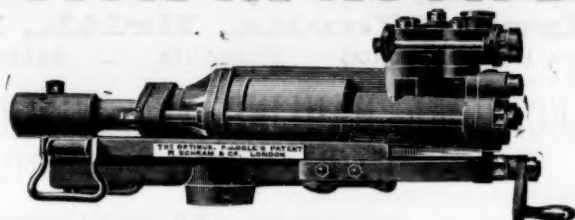
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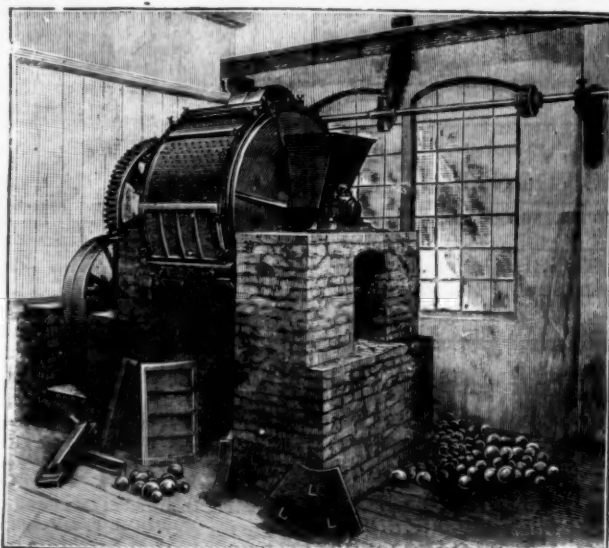
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**HENRY R. MERTON & CO.,**

2, Metal Exchange Buildings, Leadenhall Avenue,

LONDON, E.C.

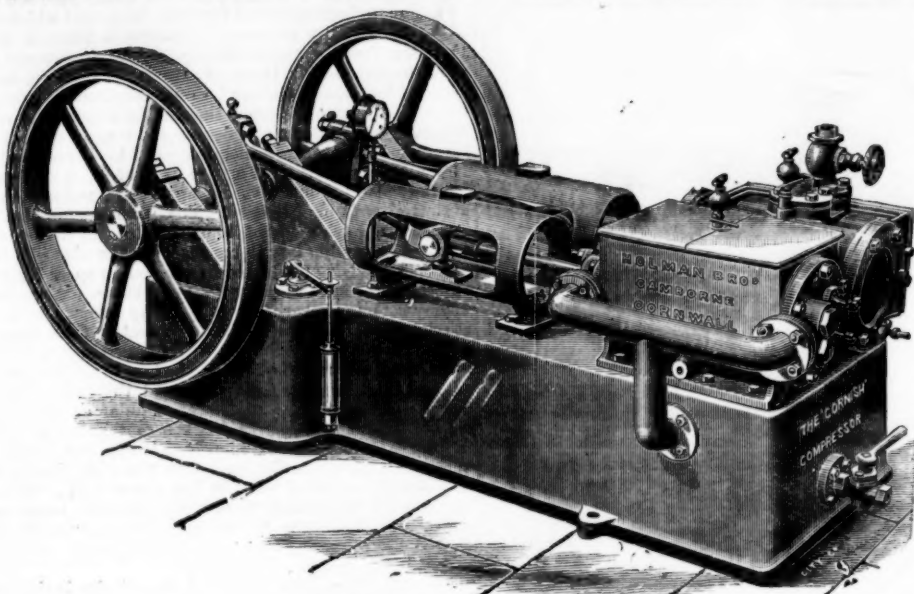
AGENTS FOR THE BRITISH ALUMINIUM COMPANY, LIMITED.



# HOLMAN Bros., Camborne, Cornwall.

ESTABLISHED 1839.

Patentees and Sole Makers of  
"THE CORNISH" ROCK DRILL and "THE CORNISH" COMPRESSOR.



## RECORD OF WORK DONE

At Botallack Mine, St. Just, Cornwall, **TWELVE MEN** with **TWO** new Patent **CORNISH ROCK DRILLS** drove, sunk, and rose **288 FATHOMS** in **12 MONTHS**, equal to five times the Speed of Hand Labour.

At Wheal Grenville Mine, Camborne, Cornwall, **SIX MEN** with **TWO** new Patent **CORNISH ROCK DRILLS** started from the **150 FATHOMS** level and put up in **EIGHT MONTHS** a **11 FEET** by **5 FEET PERPENDICULAR RISE 46 FATHOMS 5 FEET 6 INCHES**, and about midway drove **1 FATHOM 5 FT.** No communication of any kind was effected until holing to the Shaft brought down from surface.

Estimates for **ROCK BORING PLANT** and **GENERAL MINING MACHINERY** on Application.

London Offices: 7 and 9, LEADENHALL BUILDINGS, E.C.

# JOHN DAVIS & SON,

ALL SAINTS WORKS, DERBY;  
118, NEWGATE STREET, LONDON, E.C.

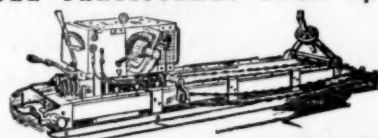
ELECTRIC LIGHT &amp; TRANSMISSION OF POWER PLANTS

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WORKED EITHER BY ELECTRICITY OR COMPRESSED AIR.

OVER 500 IN USE.

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(NON-ELECTRIC)

SAMPLES AND PRICES UPON APPLICATION.

A. B. C. Cable Code, 4th Edition.

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**AWARDS:** CRYSTAL PALACE, 1890; TASMANIA, 1891; KIMBERLEY, 1892.

# CONCENTRATION.

The Clarkson-Stanfield Concentrator (Limited).

In the CLARKSON-STANFIELD process of Concentrating Refractory and Complex Ores no water is required; dust is reduced to a minimum; the loss of Mineral through water-borne Slimes is obviated.

OUTPUT  $\frac{1}{2}$  TO 2 TONS PER HOUR, ACCORDING TO SIZE OF MACHINE.

CONCENTRATOR TO BE SEEN IN OPERATION AT THE COMPANY'S ONLY ADDRESS

6, COLONIAL AVENUE, MINORIES, LONDON, E.

The Machine is superior to Sieves for Sizing Homogeneous Substances, such as Emery, Sand, and Powders, and may be used to great advantage in the preparation of Ochre.

N.B.—The owners of the Carndochan Mine, near Bala, North Wales, will, by arrangement, show their CLARKSON-STANFIELD plant working on a Refractory Low Grade Gold Ore.

## NEW PATENTS.

LIST OF APPLICATIONS for New Patents relating to Mining Metallurgical, Engineering, Railway and kindred matters, specially compiled from official sources for the "Mining Journal" by Messrs. Rayner and Company, Patent Agents, 37, Chancery Lane, London, W.C., who will forward all information regarding them free on application.

- 1863 Johann Burgermeister, 70, Wellington Street, Glasgow.—Improvements, in rotary engines.—January 27.
- 1908 Georgina Susannah Gwynne De Lisle, 168, Fleet Street, London.—Improvements in and connected with boilers, furnaces, and flue ways, for raising steam from the combustion of trade and house refuse.—January 27.
- 1920 George Platt, 12, Southampton Buildings, Chancery Lane, London.—Improvements in governing devices and apparatus for marine engines.—January 27.
- 1928 William Edward Gibbon, 25, Mersea Road, Colchester.—Improvements in petroleum or hydro-carbon engines.—January 27.
- 1938 John Albert Fish, 45, Southampton Buildings, Chancery Lane, London.—Improvements in steam or hot water boilers.—January 28.
- 2049 Joseph Baxeres Torres, 17, St. Anne's Court, Wardour Street, London.—Improvements in extracting gold, silver, and other metals from ores and other compounds.—January 29.
- 2098 John Gill, 115, Cannon Street, London.—Improvements in rotary motive power engine, applicable also to rotary pumps, air or gas compressors, and motors.—January 29.
- 2170 John Charles Love and John Charles Hodges, 45, Southampton Buildings, Chancery Lane, London.—Improvements in furnaces, stoves, and fire-places.—January 29.
- 2113 Geoffrey Howard and Edward Terence Bousfield, 4, South Street, Finsbury, London.—Improvements in gear for transmitting rotary motion.—January 29.
- 2128 Charles Garver, 70, Chancery Lane, London.—Improvements in exhaust steam utilizing apparatus.—January 29.
- 2137 Edward Reilly, 17, Lambert Road, Grimsby.—The Nemo piston rod lubricator for marine and other engines.—January 30.
- 2151 James Weir, Holm Foundry, Cathcart, near Glasgow.—Improvements in and relating to the packing of steam pumps.
- 2256 William John Henry Dalton, 11, Farnival Street, Holborn, London.—Improvements in rotary steam engines, pumps, and the like.—Jan. 30.
- 2210 Arthur Morris, 4, South Street, Finsbury, London.—Improvements in miners' coal boxes.—January 30.
- 2225 Harry Healey Bush and James John Shedlock, 31, Southampton Buildings, Chancery Lane, London.—New or improved process and means for extracting metals from their ores.—January 30.
- 2227 Frederick Cleeve and Thomas Scott King, 168, Fleet Street, London.—Improvements connected with governor apparatus used with steam and other fluid pressure motors.—January 30.

## SPECIFICATIONS PUBLISHED.

2783. Warner and Backham, gas motor engines, 1895; 4093, Ottewill, steam engine, 1895; 4933, Stewart, steam generator furnace, 1895; 6159, Vickers, heating furnaces, 1895; 17,357, Cleveland and others, steam engines, 1895; 19,700, Gaultier and Webbs, rotary engines and pumps, 1895.

The above specifications published may be had of Messrs. Rayner and Co., 37, Chancery Lane, London, at 10d. each, including postage.

## JOINT-STOCK COMPANIES.

### NEW REGISTRATIONS.

THE following are among the joint-stock companies registered at Somerset House since our last notice:—

Lake View and Boulder Junction Gold Mines (Limited).—Registered February 4 by Buell, Son, and Greenip, 1 and 2, George Street, E.C. Capital £150,000, divided into 150,000 shares of £1 each. Objects: To adopt and carry into effect the agreement made between Hannan's Boulder Syndicate (Limited) of the one part, and C. H. Harben, jun., on behalf of this company, of the other part, for the acquisition of certain mines, mining, water, and other rights, grants, leases, claims, concessions, options of purchase, mineral properties, &c., at Hannan's Find, Kalgoolie, Western Australia, to develop and turn to account the same, and to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches.

Concordia Consolidated Mines Company (Limited).—Registered February 4 by J. S. Blankens, 29 and 30, King Street, Chancery Lane, E.C. Capital £150,000, divided into 150,000 shares of £1 each. Objects: To acquire by purchase, grant, concession, lease, license, or otherwise, work, develop, and turn to account any lands and hereditaments, or rights or interests in the same, which may be considered convenient for the purposes of the company, and also any mines, mining, water and other rights, grants, leases, claims, concessions, mineral properties, options of purchase, &c., in the Dominion of Canada or elsewhere; to search for, open, explore and work mines, quarries, collieries, oil wells, minerals, &c., and to carry on the business of a mining company in all or any of its branches.

Eagle Exploring and Finance Corporation (Limited).—Registered February 4 by Slaughter and May, 18, Austin Friars, E.C., with a capital of £300,000, in £1 shares. Object: To adopt and carry into effect the two agreements referred to in Clause 4 of the company's Articles of Association, bearing date January 18, and each made between J. D. Wolf of the one part and S. G. Bruff on behalf of this company of the other part, and to carry on any business transaction or operation commonly undertaken or carried on by financiers, promoters of companies, bankers, underwriters, concessionaires, contractors for public works, capitalists, and merchants.

Nil Desperandum Gold Mines (Limited).—Registered February 4 by Valance, Kirkbeck, and Barnard, Lombard House, E.C., with a capital of £200,000 in £1 shares. Object: To adopt and carry into effect an agreement, and expressed to be made between H. Schmidt and E. Fowling on behalf of this company, to acquire any mines, mining, water, and other rights, grants, leases, claims, concessions, options of purchase, alluvial ground, metalliferous land, &c., in West Australia, or any other part of the world, to develop and turn to account the same.

Sunbeam and Vigilant Gold Mines (Limited).—Registered Feb. 4 by H. V. Schmettan and Aucum, 31, Abchurch Lane, E.C., with a capital of £50,000, in £1 shares. Object: To acquire any mines, mining, water, and other rights, grants, leases, claims, concessions, auriferous land, &c., in West Australia, or elsewhere; to develop and turn to account the same. The directors are F. H. A. Booth, F. M. Eden, and E. W. Ruck. Qualification, £251. Remuneration, £200 per annum and 2½ per cent. of the profits, divisible.

Upper Bourne Estates and Land Corporation (Limited).—Registered February 4 by Dale, Newman, and Hood, 75 and 76, Cornhill, E.C., with a capital of £75,000, in £1 shares. Object: To acquire all or any part of the estate known as the Upper Bourne Estate, Bournemouth, upon the terms of an agreement, and to develop and turn to account the said estate in such manner as the company shall see fit.

## CONTRACTS OPEN:

FOR MINE, QUARRY, RAILWAY, AND ENGINEERING WORK, STORES, &c.

\* We shall be obliged by being promptly placed in possession of particulars regarding contracts open for competition, and of the results of successful tenders. In the latter case contract prices should be given.

The date given is that by which tenders must be delivered, in nearly all cases further information can be obtained on application at the addresses given. In applying for such the name of "The Mining Journal" should be mentioned as the original source of the information, concerning which further particulars are required.

### HOME CONTRACTS.

Railway Turntable. February 15 (Leeds).—For supply of a cast-iron railway turntable, 13 feet diameter, required for the Meadow-lane Gasworks, for the Gas Committee. Plans can be seen and further particulars obtained on application to Mr. Tooley, manager of the works. Tenders, suitably endorsed, and addressed to the Chairman of the Gas Committee, Municipal Buildings, Leeds, will be received up to 15th inst.

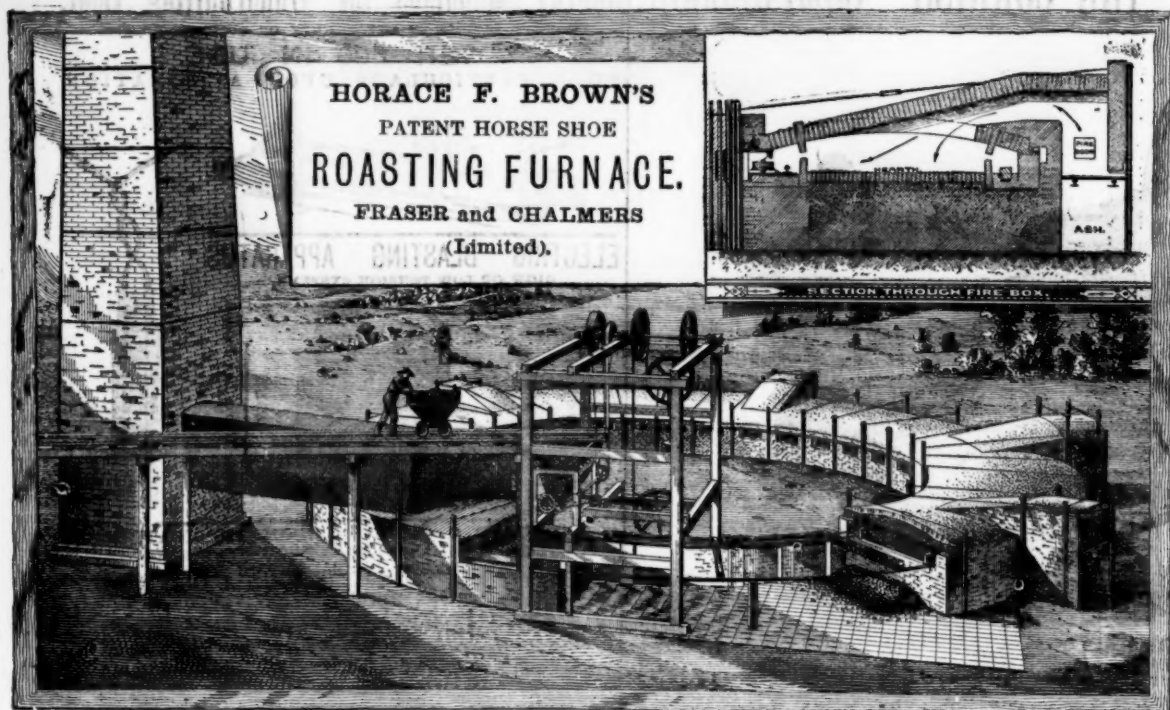
Bridge, March 8 (Bucharest).—For the construction of a wooden bridge over the River Dornavea. Estimate, 81,852 francs. Particulars from the Ministry of Public Works, Bucharest, Roumania.

River Works, March 10 (Bucharest).—The Roumanian Ministry of Public Works, Bucharest, invite tenders for river conservation and defence works on the banks of the Trotusch. Estimate, 52,329 francs.

A WONDERFUL INVENTION is one which, whilst being useful to the world, has hardly before been dreamt of by scientific men. Many astonishing proposals have frequently been made with reference to a revolution in our already rapid means of locomotion, but nothing practical has yet been effected. No doubt the time will come when a trip between London and New York will seem like a pleasant excursion of a few hours' duration. The ingenuity of man can accomplish wonders, and there is no telling when its limit will be reached. It will be difficult, however, to produce anything more wonderful than Holloway's Pills and Ointment. As sterling remedies for all complaints nothing can equal them.



# A NEW ROASTING FURNACE.



A NEW type of roasting furnace, which has been before the metallurgical world for some time, and which appears to be steadily growing in favour, is Brown's Horse Shoe Roasting Furnace, constructed by Messrs. Fraser and Chalmers, after the plans of Mr. Horace F. Brown, of Chicago. In the early types of mechanical stirrers for reverberatories it was found that the heat and fume destroyed the mechanism, and the necessity for obviating this disadvantage occupied a good deal of attention among specialists. The principle applied to the purpose in this new Horse Shoe Roasting Furnace is that of a mechanism with laterally projecting arms carrying stirrers, and working through a slotted wall or partition. The general plan of the furnace is circular, having about four-fifths of its area arched over, forming a roasting hearth approaching the plan of a horse shoe, and one-fifth left open, providing a cooling space for ore stirrers. In cross section the main walls and arch are exactly the same as in any common reverberatory roasting furnace built for hand-stirring. More fully stated, the protection from furnace heat is obtained for the mechanism used in stirring the ore by means of partitions or walls built from the hearth and extending nearly to the centre between the hearth and the roof of the furnace. These walls form inner and outer annular chambers on either side of the roasting hearth for the mechanism, and thus shield it from injury. Where a high heat is required continuous walls of fire-clay tiling are also built into the roof directly above and projecting downward towards the lower walls, leaving a space to allow stirrer arms to pass freely between lower and upper walls. By this means the trucks and moving mechanism are so thoroughly protected that they are not affected by the heat and fumes of the furnace.

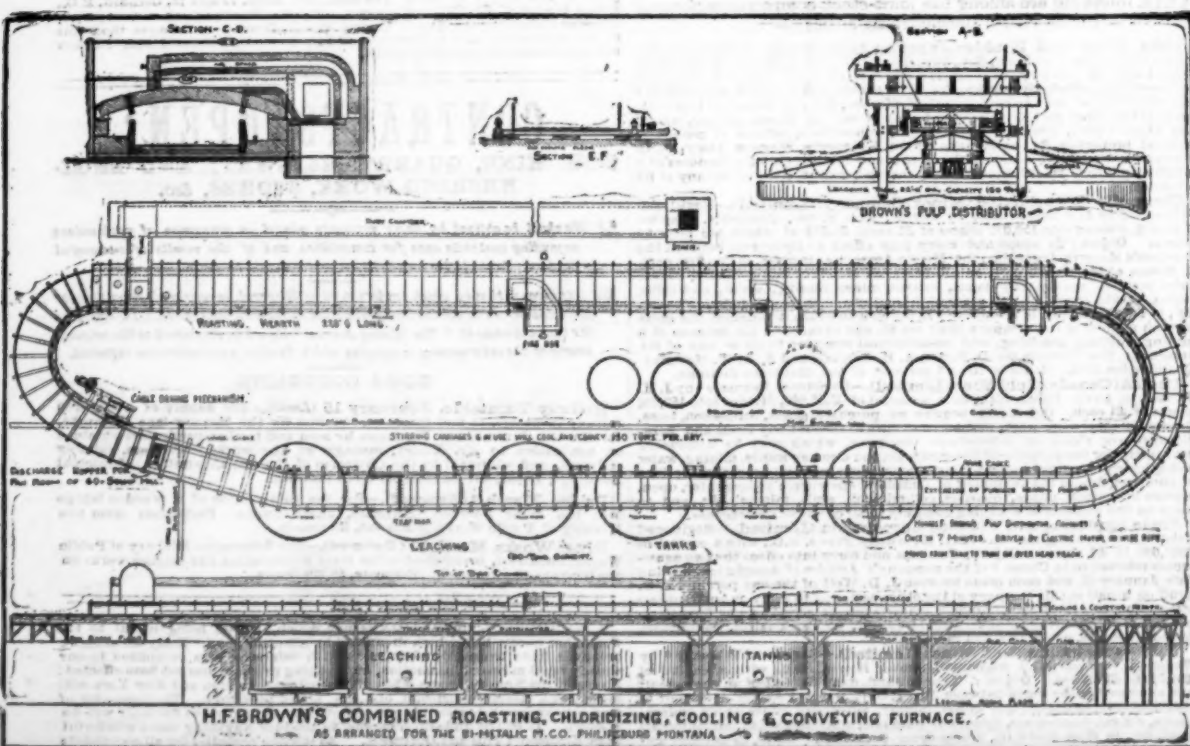
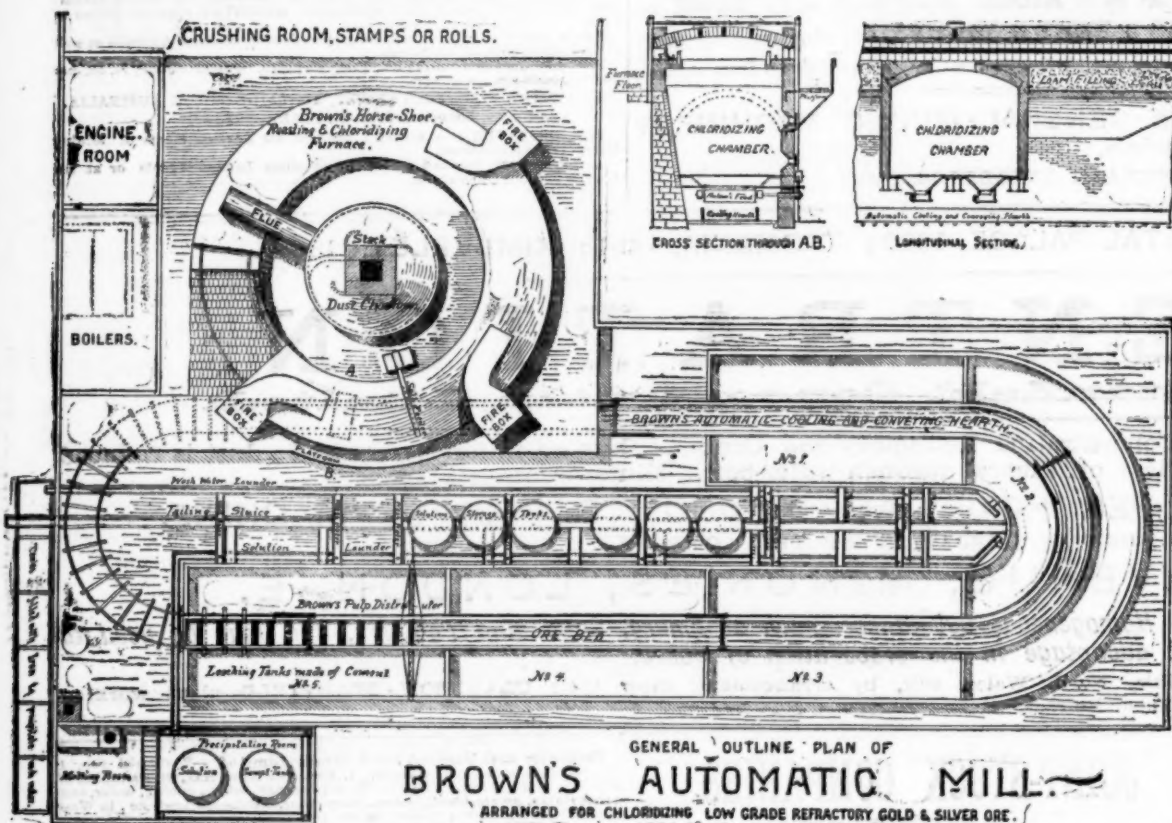
The following points, on which superiority is claimed for this over other types of furnace, may be enumerated:—(1) It is more simple in construction, requiring no more brick and no more iron work for binding rods and buckstays than the ordinary reverberatory furnace of the same length of hearth. (2) It costs to build 50 per cent. less than any other mechanically-stirred roasting furnace of the same capacity. (3) The operating mechanism is most easy to manage, and least liable to get out of order. (4) The stirrer carriages, standing half the time in the open air, are kept thoroughly cooled, and are at all times perfectly accessible. (5) Less manual labour is required, one man on a shift taking care of the machinery and fires for a furnace of 40 to 60 tons daily capacity. (6) The hearth being all on one plane there is no dust raised by falling ore, and no loss of heat, as is the case with furnaces having upper and lower hearths. (7) The feed is automatic, introducing any required quantity of ore with the passage of each stirrer, the amount being governed by a counterpoised lever, which weighs each charge. (8) The machinery is perfectly noiseless in operation. (9) All the journals that are exposed in any manner to the heat are fitted with ball or roller bearings, requiring no lubrication. The furnace embodies all the good points of the most advanced methods of roasting, and has overcome all the difficulties that have been met with in other types of furnace. It is the crowning achievement of long experience and persistent skill and effort.

The illustrations we are enabled to give of the furnace will convey a very good idea, not only of its general aspect, but also of the internal arrangements of its mechanism.

Messrs. Fraser and Chalmers are building a number of specially constructed furnaces of this type, which are elliptical in form. Each furnace has an effectual roasting hearth 8 feet wide by 220 feet long, and a cooling hearth of the same width 70 feet long. The plant is specially arranged for automatic delivery of ore to the various furnaces, and automatic discharge by conveyors to a central point of the roasted ore, and is for the treatment, on a large scale, of the Broken Hill sulphide ores by a new process, the success of which has been lately established on a working scale.

These furnaces can be built in a straight line, and of any length of hearth required by adding sufficient fire boxes at regular intervals. By regulation of size of hearth, speed of feed and firing, any desired roast can be obtained from a dead roast for chlorination to a partial roast for matte smelting or a sulphate roasting for leaching.

In conclusion, it may be remarked that the manufacturers claim for the furnace that its saving of the material hitherto lost in dust and in other ways will more than pay for the total cost of roasting in the furnace.



## TIN TICKETING.

THE fortnightly ticketing for tin ore was held at Tabb's Hotel, Redruth, on Tuesday. Result:—

VALUES OF ORES SOLD FROM EACH MINE.				
Mines	Tons cwt.	Per ton.	£ s. d.	Value.
Dolcoath No. 1	14 0	37 5 0	.....	521 10 0
do No. 1a	14 0	36 15 0	.....	514 10 0
do No. 1b	12 0	37 5 0	.....	447 0 0
Wheal Grenville A	20 0	38 15 0	.....	775 0 0
do B	14 0	38 10 0	.....	539 0 0
Wheal Bassett No. 1	15 0	39 5 0	.....	588 15 0
do No. 1a	15 0	39 5 0	.....	588 15 0
do No. 2	2 0	28 0 0	.....	56 0 0
East Pool A	13 0	29 0 0	.....	377 0 0
do B	13 0	28 17 6	.....	375 7 6
do No. 2	1 10	14 0 0	.....	21 0 0
So. Frances United, No. 1	10 0	34 12 6	.....	346 5 0
do No. 1a	10 0	34 12 6	.....	346 5 0
do	10 0	36 7 6	.....	363 15 0
Killifreth	10 0	36 12 6	.....	366 5 0
Tincroft	10 0	33 5 0	.....	332 10 0
do	10 0	33 7 6	.....	335 15 0
West Kitty No. 1	10 0	37 15 0	.....	377 10 0
do No. 1a	10 0	37 17 6	.....	378 15 0
Carn Brea No. 1	10 0	30 12 6	.....	306 5 0
do No. 1a	9 0	30 17 6	.....	277 17 6
do No. 2	1 0	21 5 0	.....	21 5 0
Wheal Kitty	14 0	37 2 6	.....	519 15 0
Phoenix United	10 0	37 17 6	.....	375 15 0
South Condarrow	4 0	38 17 6	.....	155 10 0
	261 10			£9308 5 0

AVERAGE PRICE PER TON, £35 11s. 11d.

AVERAGE PRICES PER TON.

1895.	1896.
December 3 ..... £36 10 7	January 14 ..... £34 15 11
December 17 ..... 36 4 3	January 28 ..... 34 2 9
December 31 ..... 33 17 6	February 11 ..... 34 11 11



# MINING AND METALLURGY OF QUICKSILVER IN MEXICO.

By JAMES MACTEAR.

## Part VI.

(Continued from page 170.)

## Metallurgy of Quicksilver in Mexico.

THE metallurgy of quicksilver in Mexico has practically the same history as the mining of its ores. During the period when the mines were, if worked at all, worked in secret, the old Mexican "gallery" furnace alone was used. With greater liberty of action, the Idria form of shaft furnace, with brick condensing chambers, was introduced, as well as the system of iron retorts with pipes dipping into water (originally designed by Dr. Ure). Within the last few years, one of the American continuous action double furnaces of Scott and Huttner has been adopted by the Huitzaco Company, and more lately still, a modification of the muffle system of furnace, designed by the author, has been worked with satisfactory results at Guadalcázar. Taking these in their order:—

## "GALLERY" FURNACE.

The Mexican "gallery" furnace was evidently copied from the old Saxon furnace (first used for the production of Nordhausen sulphuric acid from sulphate of iron), applied as early as 1685 to the distillation of quicksilver.

In Mexico, however, these furnaces have always been very roughly constructed, and with but little regard for consumption of fuel. They are so easily built and cost so little that the miners often erect them in out-of-the-way corners and distil small lots of ore which they have succeeded in stealing from the mine. In fact, so prevalent had this practice become at Guadalcázar, that it was necessary to obtain authority to search the various small villages and destroy the furnaces when found. The author assisted at one raid, where three of the workmen were found busily engaged with a small furnace which they had built. The whole amount of ore which they had been able to appropriate was less than half a ton, but in a country where wages are so very poor, even the small amount of quicksilver obtainable from this was sufficient to tempt them to build a furnace and run the risk of discovery.

In erecting the furnaces any available stones or mud are used, and the construction is of the most simple character. They are usually made to hold six retorts on each side. In building them a space, approximately 6 feet 6 inches long by 3 feet 3 inches in width, is enclosed by a rough stone wall. At each end an opening is left to act as a fire door about 1 foot square. On each of the longer sides a bench of rough stones and clay is built about 18 inches high and 2 feet wide. When the walls have reached a height of about 2 feet, the retorts are placed so that the inner ends rest against each other. The building is then carried on, and a rough arch thrown over at a total height of about 3 feet 6 inches. In many cases a small hole—3 inches or 4 inches square—is left at each end for the escape of the smoke, but more usually a piece of broken retort is built into the arch at two or three places along the centre to act as a chimney.

The retorts are made of the usual potters' clay of the district, and are usually about 2 feet 6 inches in length by 8 or 9 inches as the largest diameter, and taper somewhat towards the mouth. The condensing vessels are similar in shape to the retorts, but only about 13 inches to 15 inches in length, and they are sufficiently large in the openings to fit fairly closely to the retorts.

The cost of such a retort, with its condenser, in the Guadalcázar district was about 5d.

The method of working these furnaces is exceedingly simple, and at the same time exceedingly dangerous, the same men rarely working more than two or three days at the furnaces in each week, the risk of salivation being so great.

The charge of ore varies very much, according to the strength and character of the ores. With the poor quality of the San Antonio Mine (0.3 per cent.) 300 lbs. form a charge for the 12 retorts, and the distillation is completed in from 30 minutes to three hours, according to the temperature they are able to obtain. With the richer ores of the Guadalcázar Mine, not more than 150 lbs. could be treated at one charge of the 12 retorts, and such a quantity, if consisting of the soft black ore, could be distilled in about four hours, whereas sometimes as much as from 7 to 12 hours were required for exhausting a charge of "ferroso" ore, containing about 4½ per cent. of quicksilver. With such ores the use of lime is advantageous, and from 10 to 20 per cent. has been used, with the result of reducing considerably the time required for the operation.

The method of working the furnaces is as follows:—

The charge of ore having been weighed, or more usually measured out (and roughly mixed with powdered quicklime, if it be used), is divided by the eye into the proper quantities for each retort, into which it is thrown, usually by the aid of a horn spoon, but more often still with the bare hand. The men do not even seem to wear a cloth over their mouths to protect them from the fumes.

As the charges are tossed into retorts the condensers are set on and the joint made good with clay or mud. When all the retorts are charged the fire is kept going steadily, and the men prepare another charge of ore.

There are no means whatever of ascertaining when the distillation is finished, except the experience of the workmen. Sometimes the condensers have a small "nipple" on the upper side in which is a hole closed with a "dab" of mud; by opening this the men fancy they can tell better when the operation is finished. When the man in charge considers that the distillation is complete, he allows the fire to die down considerably, and then removes the condensing vessels, from which he pours the condensed quicksilver into a dish. The condenser is found to be lined with what looks like a black dust, but consists very largely of fine globules of quicksilver in a "sick" condition. With a bunch of cactus-fibre the workman rapidly brushes this out of the condenser into the vessel, and so on with each condenser until all are empty. At the same time an assistant, with a rough scraper, empties the retorts of the exhausted ore, and they are then recharged and the condensers attached as before. The exhausted ore is tossed on one side, and thus it usually happens that the furnaces are surrounded by an embankment; when this gets too high for convenient disposal of the refuse, a new furnace is built in another spot rather than carry it away.

The cost of building such a furnace was some \$8 to \$10, equivalent to about 25s. to 30s. at the then rate of exchange. The result of the distillation is a mixture of quicksilver, with a moist black earthy-looking substance which contains large quantities of quicksilver in very finely-divided globules, but which will not run together. The mass is well worked with the hands, and as much live quicksilver as possible obtained, by pressing through a cloth, and the black earthy residue—still

containing a large amount of quicksilver (often over 40 per cent.)—is mixed with a fresh charge of ore and redistilled.

Two men easily enough worked three furnaces, and the rate paid for the poor ore of the San Antonio Mine was 9 cents per charge of 300 lbs., while as much as 36 cents has been paid for the more refractory ores of the Trinidad.

The actual working results of a block of 10 furnaces during a "run" was as follows:—

Actual time of working .. ..	150 hours.
Quality of ore used .. ..	0.83 p. c. quicksilver.
Number of charges .. ..	331
Weight of ore per charge .. ..	200 lbs.
Total weight of ore used .. ..	66,200 lbs.
Containing at 0.83 per cent. .. ..	547.86 lbs. quicksilver.
Quicksilver obtained .. ..	192.45 lbs.
"Cenicillas," containing .. ..	18.22 lbs. quicksilver.
Total quicksilver obtained .. ..	205.67 lbs.
Total quicksilver lost .. ..	342.19 lbs.
Percentage quicksilver obtained .. ..	33.13

This is, no doubt, rather a bad result, but it very fairly represents the ordinary native method of working. By more careful supervision, and giving ample time for the distillation to be complete, an average yield of from 55 to 60 per cent. was obtained from these furnaces which were worked for some time at Guadalcázar.

Table VII. gives the results of nearly a year's working of such furnaces at the Guadalcázar Company's Mines, the character of the ore varying, but being supposed to be about 3 per cent. on the average. The great variation in the results is clearly shown in the table, a flask of quicksilver being obtained in some cases from the treatment of 1½ ton of ore, while in others as much as 5 tons of ore were required. The average yield of quicksilver was about 50 per cent., so that 2.4 tons of ore were required to yield 1 flask, the furnace cost of producing which was \$26. To this figure must be added the cost of the mining of the ore, but, for the period embraced in the table, this is not available, it having, unfortunately, been included in the general expenses of the opening up of the mine.

The consumption of fuel, which is entirely wood (costing about 2 cents per arroba—equal to 27½ English lbs.) was equivalent to 16½ arrobas per charge, or 2.33 tons of wood per ton of ore furnished, which is very great for the small amount of work done.

## SHAFT FURNACES.

The Idria type of shaft furnace is to be found in many places in Mexico, and has been somewhat largely used at Huitzaco. The details of construction vary slightly in different districts, more particularly as regards the condensing chambers.

Close to the San Antonio Mine at Guadalcázar a good example of this class of furnace still remains in a good state of preservation. It consists of two shaft furnaces, each of which is 3 feet 6 inches square by about 15 feet high; the corners are built up so that the shaft is somewhat octagonal in form. Ordinary iron fire bars serve to support the charge of ore and fuel (charcoal being used), and the top is arched in with a small hole for feeding the furnace covered with a plate of iron.

At the upper part of the shaft of the furnace a square opening leads into the condensing chambers; these are built of brick and smoothly plastered inside, the bottoms of the chambers being also plastered and bevelled, so that any condensed quicksilver will run into a receiving trough.

The condensing chambers consist of, first, a series of three vertical chambers, each measuring about 10 feet wide by 4 feet in the direction of the length of the building, and fitted with doors at the bottom for cleaning purposes. The openings for the passage of the gases are alternately at the top and bottom of these chambers. Following these there are two large chambers, each divided into three by longitudinal walls, which lead the gases backwards and forwards before they are allowed to escape by the chimney at the extreme end of the building. At the base of the chimney provision is made for keeping up the draught by means of an auxiliary fire. (Photographs of this furnace were shown.)

The extremely penetrating power of quicksilver vapour was shown here by the hard plaster (with which the inside of the condensing chambers was lined) being penetrated to the depth of over an inch by extremely fine globules of metallic mercury.

There is little doubt that this class of furnace would show a very marked economy in the quantity of fuel consumed over the "gallery" furnace, and the cost of producing a flask of quicksilver in such a shaft furnace was found at Huitzaco to be, including the cost of mining and establishment charges, about \$33.

The author has examined seven or eight of these furnaces in Mexico, and in every case the condensing plant was exceedingly defective. It is extremely doubtful whether more than 50 or 60 per cent. of the quicksilver originally contained in the ore has been obtained by their use.

## IRON RETORTS.

The system of iron retorts has been but little used. The great distances over which such iron castings had to be transported, and the very bad character of the roads or mule-tracks, being a sufficiently good reason for their not being adopted.

## SCOTT AND HUTTNER FURNACE.

A good description of this furnace will be found in Vol. II of "Egleston's Metallurgy of Silver, Gold, and Mercury in the United States," and in the paper by Samuel B. Christy, in Vol. XIII. of the "Transactions of the American Institute of Mining Engineers."

This furnace (shown in the drawing) consists of a tall shaft or chamber fitted with fire brick shelves fixed usually at an angle of 45°, over which a stream of ore is allowed to fall, while the heated gases, from a fire at each side of the furnace, pass alternately backwards and forwards through a series of ports arranged under the shelves.

The ore is fed in at the top of the furnace and drawn out at the bottom, taking a period of about 30 hours to pass through. Approximately, 1½ tons of spent ore is drawn from the furnace every hour.

The cost for furnace labour at Huitzaco was estimated to be \$0.26 per ton of ore, and between 2 and 3 tons of wood were required every 24 hours.

The results obtained from such furnaces in California, with properly constructed condensing plant, have been highly satisfactory. At Huitzaco, however, the condensing plant leaves much to be desired, and the percentage of the quicksilver which is obtained from the ore is far from what it should be.

(To be continued.)

RAILWAY EXTENSION IN WEST AUSTRALIA.—In West Australia railway extension in all directions is announced. The Government have concluded arrangements with Messrs. Wilkie Brothers, the contractors for the Coolgardie line, by which the construction of the line to Hannan's will be proceeded with immediately on the completion of the line now in progress. Under the agreement which has been entered into the line will be constructed on the schedule of the Coolgardie line—that is, at the same price per mile as this one. The Government have also ordered a survey to be made for a railway from Coolgardie to Menzies, via Mount Burgess.

# CARBORUNDUM: ITS INVENTION AND PROPERTIES.

THE new abrasive—carborundum—will soon be as well known in the United Kingdom as it is in the United States, for a company is about to be presented to the public, which has been formed for the purpose of acquiring the patent rights for the United Kingdom.

For the benefit of those who may not be acquainted with this marvel, turned out of the electric furnace, it may be of interest to give a brief sketch of the researches of Mr. Acheson, now the President of the Carborundum Company of the United States, in his endeavours to find a means by which carbon could be crystallised, and which resulted in the discovery of carborundum. In his first experiment he used an iron bowl lined with carbon, and filled with a mixture of carbon and clay. Into the centre of this mixture a carbon rod was introduced, and to it one of the wires supplying an electric current was attached, while the other wire was connected with the iron bowl. When the current was turned on the mixture was fused, and a violent chemical reaction appeared to have taken place. When the mass had cooled down it was opened and examined, with the result that a few very small crystals of a bright blue colour were found. In later experiments the iron bowl furnace was replaced with one constructed of refractory bricks, into each end of which extended a carbon rod, and an electric apparatus was arranged for supplying and regulating a current of from 100 to 200 amperes—an alternating current being used. Mr. Acheson soon discovered that the crystals were not what he had expected to obtain—they were not pure carbon; in colour they were usually blue, with a hardness sufficiently great to abrade the diamond. He was led to believe, from the materials used, together with the colour, hardness, and general form, that the product was composed of carbon and alumina, so he coined the name carborundum from the words carbon and corundum. It was afterwards found that carborundum is a compound of carbon and silicon.

Carborundum is now manufactured from a mixture or fusion of sand, salt, coke, and sawdust, and the electric current is supplied to the furnaces of the company from the great power houses at Niagara Falls and at Monongahela City, Pa. The furnaces are made of brick, four-sided; at the centre of each end wall there is a large bronze plate, to which four copper cables are connected. These cables convey the current. Through the centre of the mixture of sand, salt, and sawdust, a core of grains of coke is built which serves to make an electrical connection between the two terminals. When the current is turned on it soon raises this core to an enormous temperature, and a chemical change takes place, which produces carborundum. The current is kept on for 24 hours, and then allowed to cool down. On opening the furnace a ring of very beautiful crystals is found round the core varying in colour from yellow to violet, and these crystals are called carborundum.

The value of this artificial, crystalline, carbonaceous material as an abradant may be gathered from the following extracts from the official report of the Committee on Science and Art of the Franklin Institute of the State of Pennsylvania, U.S.A., of January 3, 1894:—

"It is well known to chemists that the formation of a silicide of carbon by the direct reduction of silica with carbon has hitherto been impossible at any temperature attainable in the laboratory. By the employment of the heating effect of the electric arc in a furnace of simple construction, in which the heat can be confined, the temperatures obtainable are so much greater than can be realised by any other methods. In employing the electric method to bring about the desired results, Mr. Acheson deserves the credit of having applied the only method by which it could have been successfully accomplished. The interest attaching to this compound, because of its novelty, and the mode of its production, is greatly increased by the remarkable properties which it exhibits. Those properties which are more particularly referred to are the following:—

"Permanence.—Being formed at an enormously high temperature, it is natural to anticipate that it would be stable at all temperatures below that of its formation; but in addition to this stability, it appears to be capable of resisting many of the more powerful chemical reagents. The only reagents that appear to be able of decomposing it readily are the caustic and carbonated alkalies in the state of fusion.

"Infusibility.—The substance appears to rank with the most infusible substances known, yielding only to the heat of the electric furnace.

"Hardness.—In this quality the substance approaches, if, indeed, it does not equal, the diamond, the hardest of known substances. This quality is one which, at first, would not readily be recognised, being masked by the brittleness of the crystals. It is, in brief, as an abrasive material, for grinding and polishing metals, glass, and precious stones, that carborundum has been found to possess decided merits; and when its unique physical characteristics are so thoroughly understood, that they may be utilised to the best advantage, the material, in all probability, will rank among the most valuable abrasives known to the arts. In consideration of the facts set forth, the Institute recommends the award of the John Scott Legacy Premium and Medal to Edward G. Acheson, for his discovery of a new and valuable artificial abrasive material."

The uses to which carborundum may be applied in the industrial arts in the future are so wide and the advantages so great—as, for instance, in machine, tool, and cutlery works, electrical works, glass works, and kindred trades, also by diamond cutters and polishers, brass and other metal workers, that it is no doubt destined to play a very important part in the future history of the industrial arts.

Another feature of this wonder of the electric furnace is that it is so very near the diamond that we may almost consider that we have a new precious stone in prospect whose adamant consistency is equal to the diamond, while experiments in its manufacture enables it to be produced in almost any colour, and we shall not be surprised to learn in the near future that the inventor and his associates have succeeded in producing a gem equal in lustre to the diamond, and whose colour will be but a matter of selection.

The largest electrical furnace in the world was started for making this product at Niagara Falls, U.S.A., in October 19 of last year, and 1000 electrical horse-power was turned on to the furnace, which contained a matrix of coke, sand, and salt. After a continuous expenditure of electrical energy at this rate for 24 hours the mass was transformed into carborundum, producing some of the most beautiful crystals of various colours, some resembling the finest sapphires. We understand it is the intention of the company to erect a similar furnace in England.

UNHEALTHY TRADES.—The Home Secretary has issued a certificate, under the Factory and Workshops Act, stating that the following processes are dangerous or injurious to health:—The mixing and casting of brass, gun metal, bell metal, white metal, delta metal, and phosphor bronze.

\* A paper read at the recent meeting of the Institution of Mining and Metallurgy.



## THE MINING POSSIBILITIES OF COLORADO.

(BY OUR OWN CORRESPONDENT.)

THE writer has, on several occasions, in the columns of *The Mining Journal*, tried to emphasise the fact that the selection and taking hold of undeveloped or partially developed mining properties, after careful investigation and professional advice, and at comparatively small cost in development work, demonstrating the existence of mineral in paying quantities, or abandoning the enterprise at the minimum of loss, is a more judicious, conservative, and more profitable investment than the usual method of paying a very large sum for a shipping mine, based on past records and ore reserves, and frequently getting the remains of what has been a good mine.

Mr. Osbert H. Howarth, C.E., F.R.G.S., of London, is now in Denver, on his way east from Southern Mexico, and the writer has had a very interesting interview with him. Mr. Howarth is intimately familiar, by reason of personal investigation, with many districts in Colorado, though not directly or indirectly interested in any mining property in the State, or even in the United States. He is, therefore, entirely disinterested in the matter, and speaking from the standpoint of scientific geology and mineralogy, made the following general statement to the writer:—

"English capitalists, as a general rule, should entertain with considerable caution any proposition from a mining district which is enjoying a boom, for the reason that fictitious or inflated values are placed on properties, as is the case to-day in Cripple Creek, where the owners of mining properties practically demand a premium or bonus because they happen to be in a district that is receiving abnormal attention, not merely from its undoubted value, but also by concerted action of parties more or less interested. In other words, a given amount of capital can get relatively a much more valuable property in a less lauded locality."

Mr. Howarth is strongly of opinion that the entire continuous mountain ranges running through the North American Continent from Alaska to Panama carry great mineral wealth, as yet uncovered to a very limited extent. In Colorado, for instance, if those who read this letter have access to a recent map of the State, it will be noticed that the older and well-established mining districts constitute a well-defined broad belt through the State, practically following the mountains from Boulder County in the north, to La Plata County in the south-south-west. This broad general belt contains the celebrated mining districts of Boulder, Gilpin, Clear Creek, Park, Lake, Pitkin, Chaffee, Gunnison, Hinsdale, Ouray, San Juan, San Miguel, Dolores, and La Plata counties, there being considerable intervals between the well-recognised mining districts.

The special object of this letter, however, is to call attention to the fact, which is becoming increasingly patent to all who are familiar with the various localities, that in the above-mentioned general belt discoveries are being made almost weekly that the intervening spaces also carry mineral, and that territory widely outside such general belt, is also mineral-bearing. The most striking instance of this within the last five years is the Cripple Creek district in El Paso County outside the easterly boundary of such general belt. Gold and silver-bearing ore has been found in good quantity at Manitou, in Larimer County, in the Rabbit Ears district, in the North Park in Grand County, and around Hahn's Peak in Routt County, remoteness from railroad in each case alone retarding development work. Development work is now being prosecuted on an alleged by very extensive reef of low grade gold ore a few miles above Denver on Cherry Creek in Arapahoe County. Douglas County is presenting the claims of West Creek, about 40 miles north of Cripple Creek, and said to resemble the latter place. As a further illustration among many, Mr. Howarth has been exploring generally the Sangre de Cristo range on the eastern edge of the San Luis Valley, in Costilla County, which range he reports as well worth investigating in detail. The range is 100 miles long, comprising Sierra Blanca, 14,464 feet. He examined the range in a general way for over 50 miles, and says that the chief indication is the very large development of metamorphic formations overlying the granite and the existence therein of considerable patches of Silurian and Laurentian formations. So far the district has been only partially opened up at a mining camp called La Belle and several other still smaller settlements. At Plomo there exists a freak of nature in the form of an enormous bed of quartzite lying almost horizontally, so that the bulk of it can be worked by open quarrying. So far as opened up, the ore runs an average of only \$4 per ton in free gold found in very fine particles, but it is naturally mined very cheaply. The location is only 12 miles from the D. and R.G. Railroad, and a spur could be built very cheaply.

As to the new mining districts being developed in the intervals between the older mining districts, several of them may be mentioned. Cottonwood, a few miles below Black Hawk and Central City, on the line of the Colorado Central Railroad, and 35 miles from Denver, was only discovered in November last, notwithstanding that Gilpin County miners have been passing it for 30 years without suspecting it to be a mineral-bearing district. So far as opened up, it seems to be an extension of the tellurium belt from Boulder County, the surface indications and assays fully justifying digging, and digging is being proceeded with by scores of prospect holes. A few weeks more will probably demonstrate the richness or otherwise of the district. Pine Creek and Yankee Hill are new districts of great promise in Gilpin County. Clear Creek has several new districts in which work is being prosecuted vigorously. The wonderful gold belt at Leadville is only two or three years old. Outlying territory around Cripple Creek is furnishing encouragement to prospecting and development work. There are several new districts in Gunnison County where surface digging has raised the hopes of practical and experienced mining men, who purpose spending considerable capital in development as soon as the disappearance of snow in the spring admits of such work. It is the same throughout south-western Colorado—in fact, from many different points in the intervening spaces along the great mineral belt of the State comes the information that men are putting in time, labour, and capital in judicious development work, incited thereto by the surface indications and by the fact that mining to-day can be conducted at much less cost than in former years by reason of the reduction in railroad and smelting charges, in the price of food, and of all mining supplies. Everything indicates that the next few years will see a number of places, as yet unknown to fame, come to the front as great ore producers.

In view of the above condition of affairs, Mr. Howarth says he cannot see any reason for English capitalists paying down large sums of money for partially-exhausted mines, while there is such a vast range of country justifying judicious exploration, with every prospect of the most encouraging results at the minimum of cost, and that he considers such judicious exploration and development work presents a better field for English capital than the purchase of producing mines at very high prices.

THOMAS TONGE

## MEETINGS OF MINING COMPANIES.

### MOANATAIRI GOLD MINING COMPANY, LIMITED.

THE statutory general meeting of the Moanatairi Gold Mining Company (Limited) was held on Monday, at the office, 110, Cannon-street, E.C., Mr. H. CHESTERMASTER presiding. The SECRETARY (Mr. E. Eltham Johnson) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—As you are well aware, this is only the statutory meeting of the company, which we are bound to hold by Act of Parliament. No accounts and no directors' report can be placed before you, and, therefore, no resolutions can be put. For the information of those who are not aware of the fact, I may say that the company was registered on November 7, with a capital of £200,000, in £1 shares. The present working capital is £25,000, and there are 57,000 shares which are being reserved for a future time if required for working capital. The object of this company was to acquire the Moanatairi Gold Mine, which is a property of about 95 acres, in the Thames district, North Island, New Zealand, and I believe that the locality all round has been long famed for its gold producing nature. I may tell you that this property has been entirely handed over to the company, and is now being worked by our own manager and our own men. The property was taken over by the company from November 1, and we have just lately received the account for that month from our manager, which the directors consider most satisfactory, and we anticipate great results in the future. It is intended that part of the share capital shall be transferred to Auckland, and this the directors think will be a great advantage to the company in every way. Our mine manager, Mr. Clarke, sent over a long report of the property, which he has thoroughly investigated, and is now developing, and this report appeared in the newspapers last week, so that I do not think we need trouble you to read it. You can have a copy of the report if you wish it. There are 40 heads of stamps at work on the property; therefore, we have no anticipation that the work will be stopped. Since acquiring the property we have also taken another small mining property, called the Foreshore, which adjoins our mine, and Mr. Clarke thinks that in every way that will be a most payable undertaking. The tailings on the property are at the present moment worth more than we paid for it. Mr. John J. Cooper, of the firm of Messrs. Cooper and Woodhouse, who reported on the Westworth and Aladdin Companies, is proceeding this week to Australasia, and he is going on to New Zealand to thoroughly overhaul all the work and to lay out plans with the manager as to how the property shall be developed. I am glad to be able to tell you that we have with us on the board a gentleman from New Zealand—Mr. J. H. Witheford—who knows this locality very well, and he has kindly consented, at my request, to say a few words as to the property. In conclusion, I may say that from what the directors, who have gone thoroughly into the matter, have found out about the mine, they think we have a most valuable property, and one which will shortly be dividend-paying. The results we have heard on all hands are most encouraging. With these few remarks, I will ask Mr. Witheford to say what he knows about the property.

Mr. J. H. WITHEFORD said: Gentlemen—There is no need to speak depreciatingly of any other mining country while speaking in praiseworthy terms of New Zealand, because I consider gold mining is the noblest industry of the age, and it has a most potent influence in supporting the commercial ascendancy of Great Britain. We may, as individual colonists, say that the colony of New Zealand is worthy of your support, but in making this statement I do not mean to infer that other colonies are not also, as, indeed, Africa, West Australia, and other gold-producing colonies have shown themselves to be worthy of the support that they are receiving. When we refer to New Zealand, we refer to a country with one of the smallest populations—a smaller population than any English town of 700,000 people—and with that small population they have taken out £51,000,000 worth of gold. That shows that the broad belt of gold which has been found to exist throughout New Zealand is of a very productive nature. Hitherto we have had the poorest and simplest of appliances it is possible to use on the gold fields, and notwithstanding that fact, we have these enormous returns. I notice by the Government Handbook for last year that 56 per cent. of the gold obtained last year was got by the introduction of a new scientific process, called the new cyanide process. In the mine this company has acquired nothing but the old amalgamation process has been used, and, therefore, it is very satisfactory that in New Zealand they have been able to pay £117,000 in dividends. But speaking of the Reefion district of New Zealand, although a considerable distance from the Moanatairi district, I thought it would be interesting for you to know the results of mining in the district, especially as one of the London papers has recently stated that mining in the Reefion district had never paid. The returns laid before Parliament by the Inspector-General stated that 131 companies had been created, and that they crushed 559,943 tons of quartz for a yield of 431,073 ounces of gold, representing a value of £1,623,244 10s. 10d., while the amount paid in calls was £291,028. The dividends that were received were £510,596 16s., which shows that there was £219,568 1s. 8d. more received in dividends than was paid in calls, and this is the result of a district in New Zealand which it is said never paid. Although that district is some distance from Moanatairi, when you approach nearer to the Moanatairi Mine in the Auckland gold district, what do you see there? We see one mine adjacent to the Moanatairi which paid £553,000 in dividends within 12 months, and a reef called the Caledonian No. 1 reef, that paid this dividend, traverses your property. Therefore, I think that you can reasonably consider that you hold a valuable mine that is well worth developing. I believe it is the intention of the directors to expend £25,000 of the subscribed capital in prosecuting vigorous development work upon the property, not only in connection with No. 9, Moanatairi, which has hitherto paid large dividends to its shareholders, but in developing this No. 1 reef, which has paid such enormous dividends in another claim close by; but there are other reefs of very great value which strike through this Moanatairi property, and even with the primitive appliances which they have used the dividends which they have paid are enormous. They are mentioned in the Government Handbook of New Zealand, I will read you an extract:—"The Long Drive Company paid the fortunate shareholders (among whom was H.R.H. the Duke of Edinburgh) £82,000 in a few years. The Manukau Company, which had one of the richest shoots in the annals of quartz mining, paid £15,750. The Golden Crown Company, irrespective of the large amount divided by the original shareholders, paid £141,904. The Caledonian Company paid about £500,000 during the first year of its existence. The Moanatairi Company, from whose mine over 10,000 ounces of gold were got in one week, paid £117,993; Nonpareil Company, £14,670; Kerani Company, £41,277; All Nations Company, £41,445; Old Whan Company, £11,650; Ore Company, £17,000." And these mines just surround the Moanatairi Mine. If these results can be achieved with the old primitive appliances, what may we expect when we introduce the new scientific appliances, the cyanide process, and when we have the benefits of such an engineer as Mr. John J. Cooper, who is going over shortly to see that the works are carried out in accordance with the wishes of the directors? In addition to that, we have a manager there, and I notice that his name was mentioned in the Government Handbook as being a man of high repute, and they complimented him on the way he has developed the Moanatairi Mine—I refer to Mr. George Clarke. Then, as further evidence of the actual gold to be obtained by mining in the Auckland gold district, or what is now called the Hauraki district, you have at one extremity the Waihi Mine, which, although they could not get payable returns from the Martha lode by the old process, has, since the introduction of the cyanide process, turned out some £336,000 worth of gold. When we go to the northern extremity we have the Hauraki Mine, which has turned out £80,000 worth of gold in the last 12 months. This Moanatairi Mine is equi-

distant from each of those mines—about 30 miles from them—and when you see the dividends that are paid from the mines surrounding our property, and from reefs which strike through the whole of our property, it shows we have a magnificent prospect before us. Then, gentlemen, when you look at statistics—and they are generally valuable to the English nation—you see that the average earnings of the miners on this Auckland gold field amount to £127 1s. per man per annum, and I believe that if that district does not head the list for the whole of the mining countries of the world in that respect, it is, at any rate, very near the top. And I would explain here that the list of those included in arriving at that average comprises, not only the actual miners, but shoeblacks, waiters, bottle-washers, and others who call themselves miners for the purpose of getting a vote, so that the actual yearly wages of the miners themselves come to considerably more than the figure I have mentioned. Of course, we know there are two values to all mining properties; there is the intrinsic value of the mine—and I believe myself you have a mine of the highest intrinsic value—and there is the share value, about which you, gentlemen, who are connected with the English Mining Stock Market know more than I do. As far as the intrinsic value of the mine goes, I have no hesitation in saying you have one of the most valuable properties it is possible for any London company to acquire.

Mr. KURTZ proposed a cordial vote of thanks to the Chairman and directors, which was seconded by Mr. RIDGETH, and carried unanimously.

The CHAIRMAN, in acknowledging the compliment, said the directors would do all they could to enhance the value of the company's property.

The proceedings then terminated.

### EMERALD (REWARD) GOLD MINING COMPANY, LIMITED.

An ordinary general meeting of shareholders in the Emerald (Reward) Gold Mining Company (Limited) was held on Tuesday last, at Winchester House, E.C., the chair being occupied by Mr. T. PYKE.

The SECRETARY (Mr. J. Jameson Truran) read the notice convening the meeting.

The CHAIRMAN, in moving the adoption of the report and accounts, said: Gentlemen—When we met the shareholders in September last, we laid before you the position of the company so far as we could then judge, and the disappointment felt by the board, as well as by the shareholders, at the serious falling off in the returns from the Emerald Mine, and after a full and exhaustive discussion of all the circumstances, you decided to empower the board to deal with the proposal to purchase further properties as they might deem advisable. You all know, from the circulars which have since been issued by the board, that the Shamrock Mine has been purchased, and a change of management was deemed necessary in December last, as Mr. Porritt's term of office expired that month. Captain Penberthy reached the mines about December 18, and has since cabled and reported that he desires some little time to satisfy himself of the value, or otherwise, of the Emerald veins, and with this view he proposed to expend about £1000 in crosscutting the property at or above water level; so far, we regret that he is unable to report having met with anything of value in developments, but tributors have got out some 80 tons of ore, averaging 1 ounce to the ton. We have received a report from Captain Penberthy, which I will ask the secretary to read later on. It is gratifying to the board to learn that Captain Penberthy, on his arrival at Geraldton, was greeted by the Press and residents as an old friend, as it appears he resided in that locality some 25 or 27 years since, when in charge of a copper mine in the district. *The Geraldton Advertiser*, of December 16, spoke of him thus:—"Old colonists will learn with pleasure of the return to West Australia of Captain Penberthy, who had charge of the Wheel Fortune Copper Mine at Northampton from 1863 to 1868. We had an interview with Captain Penberthy on Saturday, and it was astonishing to witness the vividness of his recollection of men and things connected with the past of this district. During the 27 years which have elapsed since Captain Penberthy left West Australia, he has been following his profession of mining superintendent in various parts of the world. He has been Chili, Buenos Ayres, Venezuela, Nicaragua, South Africa, and, in fact, almost every mineral country in the world. Captain Penberthy's object in returning to West Australia is to take charge of the Emerald Gold Mine at Yalgoo, and the directors may congratulate themselves on securing the services of one who, even in his young days, was distinguished as a mining manager, and who is held in respectful remembrance by many old hands." I mention this to show that your manager is a gentleman of wide experience, and bears a very high and upright character, so that we believe any recommendation of Captain Penberthy might be taken with confidence and safety. This brings us to a point I wish to submit for your consideration. There are, no doubt, many valuable mines in the neighbourhood of the Emerald, and should our manager fail to get any more payable ore in the mines at present owned by the company, we are of opinion that he should look around, examine, and see whether he cannot get the option of purchase for (say) three or four months, of a desirable property, which would come within our means of acquiring, and give us time to submit such proposal to the shareholders for their approval and sanction, before completing the purchase. This seems to us a perfectly legitimate object to keep in view, and we may, by this means, become a prosperous company, even if we have to change our workings from the Emerald property. The accounts are before you and speak for themselves. The profit on the year's working, though not large, is on the right side, and might have been swollen to, perhaps, £1200 or £1500, but your directors preferred charging everything to revenue, except the outlay on machinery, thereby reducing the apparent profit. I will now read the following telegram which have been received in reference to the property:—Telegram forwarded to Captain Penberthy, February 4:—"General meeting of shareholders February 11. Telegram as soon as possible how are the developments progressing." Telegram received February 6:—"We are now milling ore from the men working on tribute, 80 tons; the estimated yield 20 dwts. per ton. Cannot finish till February 13. The explorations have not as yet given us much ore, but we have learnt a good deal from them of the nature of the vein. Average width of lode is 4 feet. The ore is too poor to pay for extraction.—Shamrock. The full breadth of the lode 6 inches. The vein at present yields a very low grade ore." Telegram forwarded February 7:—"Is exploration work likely to succeed; what would you recommend in the future?" Telegram received February 10:—"Cannot yet state with certainty; more extensive explorations must be made; two months. I strongly recommend obtaining new mining properties." I will conclude with moving the adoption of the report and accounts, and when this has been seconded, I shall be happy to answer any questions any shareholder may put to me.

Mr. J. H. STANLEY seconded the motion for the adoption of the report and accounts.

The SECRETARY then read Captain Penberthy's report as follows:—

"Yalgoo, January 3.  
The Secretary Emerald (Reward) Gold Mining Company (Limited),  
185, Gresham House, London.

"Dear Sir,—In accordance with my promise to you last week, the result of my inspection of the lodes in the El Dorado and Shamrock Concessions is as follows, viz.:—The El Dorado. I have looked over the back of this lode at surface very carefully, and find it in good form, being about 2 feet wide, and looks of a very permanent character, composed chiefly of hard glassy quartz, and situated in a dioritic schist formation, and bearing 45° west of south. There are two shafts sunk on this to the water line 35 and 33 feet, and levels driven for a distance of 50 feet in a lode varying from 18 inches to 2 feet wide, but unproductive. The cost of driving would be about £2 per foot, which I consider too expensive for prospecting in what appears to me an unproductive reef. I purpose adopting a



more expeditions and less costly method of prospecting this lode, and which is equally successful, viz.:—The opening up on the back of the reef for from 2 feet to 2½ feet deep, which will reveal fully its character and worth.—The Shamrock. This lode bears about 55° west of south, and is about 18 inches wide, on which three shafts have been sunk, two of which are 40 feet deep, the other about 12 feet. In the shallowest shaft the lode is from 18 inches to 2 feet wide, and shows specks of gold occasionally. The lode is composed of quartz and iron pyrites, and looks very kindly. I intend putting on three or four men on this reef just prior to the expiration of exemption time, to raise from 15 to 20 tons, and put same through the mill. This will ascertain the full value of the lode. I shall take the same course with the back of this lode as I mentioned in connection with the El Dorado, as it is very often the case we discover the mineral at surface before elsewhere.—The Emerald Point No. 1: I have just been fortunate enough to let a piece of ground south of the tramway to two miners, who know the Emerald, to work on tribute for two months, paying them 12s. in £1 sterling for all quartz raised to the surface, the company paying all expenses of the crushing and providing them with timber to secure the ground, the tributors finding all blasting materials, &c. I shall take the first opportunity of letting other contracts of this nature at every point possible.—Point No. 2: This shaft has now been completed by the insertion of ladder ways, &c., for the men to come and go to and from their work which will begin in the course of a few days. They are just now opening on the back of a large lode bearing towards the surface below that was so productive. I wish particularly to ascertain what influence this has upon the ground last mentioned at the point they junction.—Point No. 3: Here the four men engaged having been doing good work at the bottom of the surface shaft. They have extended the crosscut about 3 feet north, and I think from the appearance of the ground at this place we are through the footwall of the lode. This I shall prove in a day or so, and if so shall bring the men back and begin driving east and west upon the branches of the lode. In the west end the men have already driven about 2 feet, and in a branch of quartz about 16 inches wide, but it does not show any gold. Just over this point, at the surface, I have two men prospecting upon the back of the reef, which here is very large, the full size being unable to ascertain yet, and is also extremely poor, although at times samples will show a few colours from the footwall.—I am, yours faithfully, James Penberthy manager."

The motion for the adoption of the report and accounts was then put and carried unanimously.

The CHAIRMAN, in moving the re-election of Mr. J. S. Sprent as director, spoke of the valuable assistance he had always rendered in the conduct of the company's affairs.

Mr. ILLINGWORTH seconded the motion, which was carried unanimously.

On the motion of Mr. RICHARD DONAGAN, the company's auditors, Messrs. Ford, Rhodes, and Ford, were unanimously reappointed.

Mr. RICHARD DONAGAN, in moving a vote of thanks to the Chairman and directors of the company, said he was sure the board were doing their best in the difficult circumstances in which they were placed. The new manager was, he believed, a very clever man, but he must be given a sufficient time—three or four months—to do preliminary work, and there was little doubt that he would come upon something in that time. In addition to this, the tributors were at work, and they could not take out 80 tons of ore without opening up part of the mine, and the company would succeed to any discoveries they might make as soon as their tribute was over. Other tributors were likely to be put on, so that between the two sets of tributors and the manager, they might succeed in coming upon the rich ore which was found in former times. As to the acquisition of another property, which Mr. Penberthy had mentioned as a desirable course, that matter might safely be left in the hands of the board. No doubt Captain Penberthy would see whether there was another property worth buying, and it was desirable that this should be done in good time; but the shareholders would probably hold with him that the board must not go to too great an expense in regard to that matter, lest, after they had acquired the new property, their own should turn out well, while they were left without the money necessary to develop it. At the same time, whatever could be done within reasonable limits ought to be done. (Applause.)

The vote having been carried by acclamation, the CHAIRMAN returned thanks, saying the board would do everything in their power to make the company a success. The proceedings then terminated.

## COROMANDEL GOLD MINING COMPANY OF INDIA, LIMITED.

The fourth ordinary general meeting of the shareholders in the Coromandel Gold Mining Company of India (Limited) was held on Tuesday, at the Cannon-street Hotel, Sir CHARLES TENNANT, Bart., presiding.

The SECRETARY (Mr. John Garland) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—The accounts do not exhibit any feature calling for particular comment. The capital account shows that at the date of the balance-sheet 17s. 6d. per share had been called up, and the final call of 2s. 6d. has just been made, and is payable on the 15th inst. The expenses, as our superintendent in his able and interesting report remarks, have been kept as low as is compatible with the efficient working of the mine. Shareholders are aware that a new battery of 20 stamps has been ordered, and for some time past has been in course of erection. A telegram from our superintendent, received yesterday, informs us that he anticipates commencing crushing in the beginning of March, and it is satisfactory to know that there is plenty of quartz opened up in the mine ready for the mill. The progress of mining operations during the past year has been very encouraging, showing a great increase in the amount of work done as compared with the preceding year, and the results of our operations have been satisfactory. We are opening up what we believe to be a good mine; work has been steadily going on, and our reserves of discovered ore gradually increasing—I think I might say, rapidly increasing—for whereas when we met you 12 months ago, we could speak only of 8000 tons of quartz in reserve, the total quantity on September 30 was no less than 24,000 tons, or an increase of 16,000 tons in the 12 months. This, gentlemen, I think you will agree with me, is a satisfactory result of the year's work. The particulars in regard to the mine will, as usual, be furnished you by Mr. Taylor. I will say, however, that the condition and prospects have greatly improved since we last met. This reserve of 24,000 tons of ore is sufficient, without any further discoveries, to keep our new mill going, crushing at the rate of 1000 tons per month, for the next two years. Our capital, it is true, has been greatly expended, but we hope that it is still sufficient to carry us on until the expenses of the mine can be paid out of the gold produced from it. The following is a copy of a telegram received from Mr. Llewellyn, dated February 10:—"Shaft has reached a depth of 600 feet. We are at present crosscutting.—500 feet level north, Prospect shaft east of the dyke. Reef 2 feet 6 inches wide, and assays 12 dwts. per ton.—Bottom drift from winze. Reef 18 inches wide, and assays 1½ ounce per ton. Expect to start milling on or about March 10." I think now it is only a matter of waiting a little longer before receiving some reward for our patience and outlay, and I trust that the history of the Mysore and Hampton Reef, an anxious one at the first, will be repeated in the Coromandel. I will now formally propose:—"That the directors' report and balance-sheet to June 30, 1895, be received and adopted."

Mr. W. G. PROBYN seconded the resolution.

Mr. JOHN TAYLOR said: Gentlemen—At the time of our last general meeting, a little more than a year ago, a discovery had just

been made of a rich reef in a crosscut from Prospect shaft at the 440 feet level, and the mining work at the Coromandel Company's mine has since been confined almost entirely to the vigorous development of that pay-shoot. This new shoot has turned out to be an undoubtedly valuable one, and the result of the year's operations is a vast improvement in the condition and prospects of our enterprise. Great energy has been displayed in the prosecution of these underground explorations, and in a remarkably short space of time ground has been laid open for stoping to a depth of 600 feet. Levels have been driven considerable distances upon the reef at 200, 320, 440, and 500 feet, and the east shaft has been completed entirely in the time from the surface to 500 feet deep, below which we have now a winze sunk to a depth of 600 feet, and a level already driven some little distance at that depth. The point at which the reef was first intersected after driving through the dyke north of the Prospect shaft was at the 440 feet level, but I will begin to describe the pay-shoot at the two levels above. At the 200 feet a crosscut was driven through the dyke and out the lode, which was found at the point of intersection to be 3 feet wide, and worth 1½ ounces. The 200 feet level was driven north to the east shaft 150 feet, and for 100 feet of that the reef averaged 4 feet 4 inches, and was worth an average of 1 ounce 6 dwts.—a very nice lode. Just before reaching the shaft we came to a fold, and there the lode was very wide, it being reported at one time to be 9 feet wide, with a value of ½ ounce. North of the east shaft the 200 feet level has been driven a considerable distance. The reef at one time was 1½ feet wide, and worth 2 ounces to the ton; but, on the whole, that level has not been rich. At the 320 feet level, south of the east shaft, the reef was at one time 3 feet to 4 feet wide, with an assay value of about ½ ounce; but there again we have not proved any rich ground for stoping. In these cases we always hope that, as there is an appreciable quantity of gold in the quartz, as we stop above the level we shall find it better than in the level itself. The same level was driven north of the east shaft 225 feet; there for about 90 feet we had a very large lode, 3½ feet to 4 feet wide, but only worth about ½ ounce. Then the level came to a fold, which heaved the reef away, but since the report was written it has been recovered. The latest intelligence, dated January 11, stated that the reef there—although narrow—only 6 inches wide—was rich, being reported to be worth 2 ounces 6 dwts. The 440 feet level was driven south from the east shaft 133 feet. There we had a reef averaging 1 foot 8 inches wide, with the value of 1 ounce 7 dwts. up to the dyke. North of the east shaft the 440 feet level was driven 230 feet; the reef has been from 1 foot to 3 feet wide, and worth ½ ounce to 1 ounce 8 dwts., and in the rise above that 440 feet level north for about 130 feet upon the "fold" I have mentioned, we had a reef more than 4 feet wide, and worth about 16 dwts. In the 500 feet level, for 60 feet south from the shaft, we had the best piece of ground we have yet found on this pay-shoot. 60 feet brought us to the dyke, but before that was reached we had a lode 3 feet wide, averaging 4 ounces to the ton—a very good reef indeed. North of the east shaft the 500 feet level was driven 168 feet, and the lode there has been very much interfered with by a slide, which happened to almost exactly pass along with the reef, and has very much impoverished and disturbed it at that particular point. Below the 500 feet a winze was run down 100 feet—a sufficient depth for another level—and we have already driven south from there in the 600 feet level. This level was only started about six weeks ago, and at the date of the last report it had been driven 66 feet in a strong, well-defined lode, 1½ to 3 feet wide, and worth from ½ ounce to 1 ounce 4 dwts. Judging from the 500 feet level above, we should, in going towards the dyke, soon see an improvement in the 600 feet level south. In order to command this pay-shoot satisfactorily, it was necessary that a shaft should be sunk, and, by means of winzes, this east shaft has been sunk very quickly from the surface down to the 500 feet level. The reef in the shaft itself has been from 1 foot to 4 feet 6 inches wide, and worth from ½ ounce to 2 ounces. That shaft is now being equipped with hauling machinery, not only for hauling the stuff, but also for bringing the men up and down. This is a short story, but there is not much to be said, as there is only one pay-shoot to talk about. You will understand that the operations carried on during the year have carried with them a great measure of success, and that a shoot of ore of considerable value has been opened up in the 440 feet level. The length of that shoot is just about 300 feet, and in places it is a very productive reef. The substantial nature of this development is clearly evidenced by the increase in the reserves from 8000 tons to 24,000 tons, a large portion of which is already stacked and ready for milling. In connection with this, we must bear in mind that estimate of reserves was made up on September 30. The mill we hope will get to work about a month hence, and you will easily understand that, in addition to the 24,000 tons, there will be a further quantity of quartz raised by that time. Those who have read the reports will easily see that we have to deal with a mine presenting endless complications. We have dislocations of the reefs by dykes, crosscourses and slides, which render it impossible to understand these workings without a most careful study of the plans and sections. To conduct these mining operations successfully calls for the utmost vigilance, and also for a very considerable mining knowledge, and I desire before I sit down to congratulate Mr. Llewellyn upon the able way in which he has conducted his work, and upon the success which has so far attended his efforts. (Applause.)

The CHAIRMAN, replying to a SHAREHOLDER, said although this year the accounts were only presented up to June 30, 1895, the directors were taking steps for them to be made up in future to a later date.

A SHAREHOLDER asked whether the 500 feet level from the east shaft which went south for about 60 feet, and was worth 4 ounces, stopped at the dyke.

Mr. TAYLOR said he was afraid so.

The resolution was then put and carried.

The two retiring directors, Sir Charles Tennant and Mr. W. G. Probyn, were unanimously re-elected, and a similar resolution in regard to the auditors, Messrs. Cooper Brothers and Co., was also passed.

An extraordinary general meeting was then held for the purpose of altering the Articles of Association in order to appoint Mr. Edgar Taylor as one of the company's managers.

The SECRETARY having read the notice convening the meeting, the CHAIRMAN formally moved the resolution, which was seconded, and carried *anv con*.

This terminated the proceedings.

## GOLD LANDS CORPORATION, LIMITED.

The statutory meeting of the shareholders in the Gold Lands Corporation (Limited), was held at Cannon-street Hotel, E.C., on Thursday, Mr. ALEXANDER FRASER presiding.

The SECRETARY having read the notice convening the meeting,

The CHAIRMAN said: Gentlemen—This being merely the statutory meeting, there are no accounts to be presented to you, but I have no doubt you will like to hear something about this corporation from its formation to the present time. The issued capital of £155,000 was subscribed for privately, about one-fifth of it being allotted to a financial group in Paris. With regard to the remaining four-fifths, we had many more applications from our friends than we were able to supply. Your directors lost no time in commencing negotiations with regard to properties in West Australia. The moment, however, not being propitious for putting new ventures before the public, we, carefully watching your interests, decided to keep our cash in hand and intact, so as to be in a position to promptly entertain suitable business. You may enquire why we did not make some investment in stocks during the later depression. This question was duly considered, but we decided that, though no doubt we might be successful speculators, yet in the long run we should do better for you with less anxiety for ourselves, if we adhered to undertakings into which we could enter on the ground floor, and which we could confidently recommend

to our shareholders and the public as sound. Well, we are now in a position to offer in a few days a property which I think not second to any yet put before the public. It is in the Hannan's District, extends over 430 acres, and we are advised that it contains some of the best reefs that are characteristic of that district. As to this, Mr. George Gray, whose name is well known to you as the mining manager of the Colonial Finance Corporation, and the Hannan's Proprietary Company, has given us a most satisfactory report, and I need say no more at present. It is the intention of the board to allow our shareholders to have the preference in applying for the issue of the corporation being formed to acquire this property. Already offers have been received to supply a considerable portion of the capital. You will receive a prospectus and notice from the corporation in a few days giving you all particulars, and if you subscribe to the issue you will benefit your holding in Gold Lands and be certain of securing an interest in its first venture. Your directors are carefully prosecuting inquiries with regard to other business, and you will be glad to know that the Hon. H. J. Saunders, of Perth, is looking after your interests in Australia as our agent. Besides this, we have appointed a qualified engineer on the fields, who will keep us in close touch with all that is going on. The name decided on for this corporation indicates sufficiently that our idea was not necessarily to confine our interests to one colony, and, accordingly, at the present time we have an interest in a Barberton property, which, from a cable we have just received, is likely to turn out very well. We have other indirect interests in Africa, about which I had better not now say more than that we have reason to hope they will be of a most profitable nature. I have been asked why the financial papers have not quoted our company's shares in their lists. The time will come when they will do so. I see, however, that the *Times* quotes prices of Gold Lands daily. It was not our wish or intention that the shares should be rushed up to a big premium. Our idea is that they will soon enough command this from their intrinsic merits and value. Your directors' holdings in the corporation are large—I may say very much larger than usual—and you may be quite sure they will watch carefully its various undertakings, and leave no stone unturned to make in the near future what all shareholders look for, namely, satisfactory dividends. (Applause.) If any question is asked that I can answer, I shall be very pleased to reply to it. I may add that we have to-day just completed the articles for the new corporation, which is to be called the Hannan's Kalgoorlie Proprietary (Limited). A good many gentlemen have signed the articles this morning, and if any of those present would care to do the same before leaving, the articles are here on the table; they can be signed for anything not less than 1000 shares.

A vote of thanks to the Chairman and his co-directors terminated the proceedings.

## HAMPTON TRUST, LIMITED.

The statutory general meeting of the shareholders of this company was held at the offices of the company, Finsbury House, Blomfield-street, E.C., on Monday, Mr. R. HERBERT LAPAGE being in the chair.

The SECRETARY (Mr. Felix F. Wilson) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—You have been called together to-day, as you are aware, to comply with the Companies Act, which provides that the first ordinary meeting shall be held within four months of the incorporation of the company. We have no accounts to present to you, and during so short a time we cannot have been expected to have done much business. You will, however, doubtless be glad to hear that something has been done. We have already acquired a few town sites in the gold fields, having purchased two blocks in Coolgardie, one of which is in the main street, also a block at Hannan's and another at Menzies. We have also been fortunate enough to secure one-third share in an option on Speakman's Find, known as the Callion. This property is situated about 75 miles in a north-westerly direction from Coolgardie, and consists of 30 acres. The property has already been reported on by Messrs. Bewick, Moreing, and Co., very satisfactorily, and we believe that this will turn out a very valuable asset to this company. I may mention that there is a lode of from 12 to 20 feet wide, and the samples taken for Messrs. Bewick and Moreing's report gave an average of 4 ounces of gold to the ton. Some of the stone assayed as much as 7½ ounces. We are now developing this property further before exercising the option. I may also say that we have instructed our agent in Western Australia to pay the deposit of £300 on a property in the Lake Darlot district, for which we shall get a four months' option on it. I am not able to say at the present moment whether we have secured this option, as we have not had a reply from our agent. We have also acquired an interest in two mining leases in the White Feather district, about which I am not able to say much at present, but the accounts we have of the property were sufficiently favourable to induce us to invest £500 in the venture. You will see, gentlemen, that we have not been idle since the formation of the company, and we have every reason to believe that your company will succeed in doing a profitable business.

A vote of thanks to the Chairman terminated the proceedings.—Communicated.

## HETTY GOLD MINE, LIMITED.

The adjourned statutory meeting was held on Thursday, at the Great Eastern Hotel, E.C., Colonel A. E. Roas in the chair.

The SECRETARY (Mr. Newman Goldman) having read the notice convening the meeting,

The CHAIRMAN said: Gentlemen—We took over the property in the early part of October, but in the meanwhile it had been arranged that two directors should go out to the property as soon as possible. Those directors were Mr. Adams and myself, and we decided that until those directors got on to the ground and had looked about them that no expenditure whatever connected with sinking, &c., should be made. We arrived on November 25 at the property, and our first object was, if possible, to see what was being done in our immediate neighbourhood. I must tell you that there are no workings anywhere round about us with the exception of to the south and the east. Those workings to the south of us are very near, so near that it became of great importance that we should endeavour to get down into those workings and see what there was to be seen, and we made our way towards the manager of that property—the New Midas. Fortunately, we had been able to do him some small service in the way of letting him have some building stones for the foundations for his stamps, and this assured us a very hearty welcome, and I was never more pleased when he asked us to go down into the mine. The shaft was only about 64 feet deep. We went along the workings, where we saw a good deal of the Black reef lying perfectly exposed; the workings extended for a considerable distance—probably 2000 or 3000 feet. There were drives running out of the workings in the direction of the boundary of our property. I went along one or two of those drives, and was very pleased to see the Black reef going along steady and strong in our direction. The Black reef does not follow the usual course of the reefs in the Witwatersrand. It runs horizontally with waves, but practically you may call it horizontal. I saw the reef running about 2 feet, sometimes a little less and I was very well satisfied with all I saw on that occasion. So satisfied were we—Mr. Adams and myself—that when we again arrived at the surface, we expressed ourselves as very well contented with our venture. The Black reef is patchy, rich here and poor there, but the average



we were told was about 1 ounce 15 dwts. I have since seen it in print that it averages about 1 ounce 13½ dwts., so that we were pretty near the mark. I need hardly tell you that is a very good yield. When we went out we took our manager with us, and he was with us on the occasion of our visit. We lost no time in getting him on to our ground, and we were able to locate him in a house about ¼ of a mile from our boundary, and 1½ from the workings. About December 16 he commenced work; he began by sinking seven shafts on the north-eastern portion of our property at the regular distances that miners usually sink them, either for ultimate sinking or for ventilation. He had the command of only a small amount of labour, and it was difficult to get more, but he managed to work on until political events came to a head on December 30. On New Year's Eve he was compelled to go into Johannesburg. He was at Johannesburg for eight days, and when he got back to the property all the "Kaffir" boys, with the exception of 10, had gone. He set to work with these 10, and he has supplemented them from time to time, and he now probably has more than 20 at work. That, however, is a small crew to begin working with. I am pleased to be able to say that I think our manager is a man who will be able to manage his "boys" very well, and they require management. We came away with the utmost confidence in that mine; we were perfectly convinced we should get the Black reef when we had sunk down to the required depth, and I am very happy to tell you that so far the indications are exceedingly favourable. By the mail which arrived last Monday we are informed by our manager that he has come across a small reef carrying gold, of which he says:—"Panning the Black reef is unsatisfactory on account of the quantity of heavy iron sand that is in it;" but when he says:—"The show in the pan was satisfactory," I myself am very satisfied indeed. We have, therefore, absolutely got already a small reef within the very short time we have been at work, and this, I think, you will admit is pretty good. He adds:—"I have every reason to believe that the reef will greatly improve in body as we drive east of it, we being so near the Midas, where it is well known they have a strong reef." He goes on to say:—"The formation of the eastern half of Rothery to the north is continued through the western half of Hetty, as the plan shows"—that plan has not yet been received. "The rough geological section of Hetty indicates two small basket leaders; these will receive my attention." Of course, in due time all these points will be decided upon and worked; but in the meanwhile we must have a little patience, because things are not straight there yet. It will be necessary for us to build some houses on this ground because there is not a thing there at the present moment except huts for the Kaffir boys. We must, therefore, not be in too much of a hurry to cut through this reef, but allow the manager to get things in order. I think he has done remarkably well since he has been there, and as soon as the assays come they will be communicated to you. There is one little matter connected with the water supply I wish to mention. A water right does not necessarily mean a bit of river. It may, and generally does, mean a hollow or a spruit between two elevations which is dammed at the bottom, and when a thunderstorm comes on—and they do so pretty frequently—the water is secured. That is called a water right. We have some of that ground on our property, but we are entering into negotiations with another company which has water rights, and we believe we shall be able to obtain the use of that water on very reasonable terms. I wish to state in the strongest possible way that I have the most entire confidence in the Hetty, and have had ever since I went down the Midas Mine. I am fully confirmed in the belief that we have got hold of a good piece of ground, and I have great pleasure in being able to state that publicly to-day.

Replying to Mr. McCALMONT HILL and other shareholders, the CHAIRMAN said: The company possessed 94 claims, and, roughly speaking, the acreage was about 123 acres. In that district most of the reefs dipped to the west, or were vertical, but the Black reef was horizontal, so far as one could judge when walking under it. That was a peculiarity, and entirely different from other reefs in the district. He was certain they would cut the reef. They had about 500 shareholders, amongst whom 110,000 shares had been allotted, and they had close upon £30,000 in hand. They had in addition 10,000 shares in reserve for future use. They had not as yet spent anything upon the ground. It was the intention of the directors to work the low grade ore, as by the cyanide process they could recover all the gold, with the exception of about 5 per cent. The Rand Reduction Company were now putting up on a part of the Robinson ground some plant, which he was not allowed to see, because it was a secret to treat tailings which came away from the cyanide process, and it was said they would get enough gold to pay them. With the present appliances it was obvious they would be able to work low grade ore.

The meeting then terminated in the customary manner.

### RHODESIA, LIMITED.

An extraordinary general meeting of the shareholders in Rhodesia (Limited) was held yesterday, at Winchester House, E.C., Sir G. W. R. Campbell, K.C.M.G., presiding, when resolutions, proposing to increase the capital of the company to £300,000 by the creation and issue of 100,000 shares of £1 each, for amalgamating with the Bulawayo Mining and Finance Company, and for authorising the directors to elect an alternate director to act in their absence, were submitted. The Chairman, in moving the first resolution, said if the proposals were carried, it would enable the company to absorb some most valuable property, and would render them one of the strongest of the South African companies. The movement was brought about by the energy and business capacity of their colleague, Mr. A. Grove, who went out to Rhodesia, and, after making most careful local enquiries, came back and recommended them to take that step. Rhodesia (Limited) would acquire from the Bulawayo Mining and Finance Company 13½ town stands in Bulawayo, three freehold farms in Matabele, aggregating about 18,000 acres, one undivided third share in gold areas about 10,000 acres in extent, and other property. In all, the price to be paid was £10,000 in cash, of which they had the money, and 60,000 fully paid-up shares. They had arranged to acquire the property more cheaply than they expected at first, but this was due, no doubt, to the recent depression in South African affairs. Other advantages included the engagement of Mr. Marshall, of Johannesburg, who had agreed to join the London board, and Messrs. Knapp and Herscher, of Rhodesia, both of whom would take part in the management of the development of the property. All three gentlemen would have an interest in the company. Another advantage that would accrue to both companies, was that there would be only one set of managers, one board, and one secretary, thus effecting a greater saving of expense. When they met on the last occasion he told them of the interests that had been acquired by Rhodesia (Limited). They comprised 27½ stands in Bulawayo, 33 farms in Matabele, covering an area of 330 square miles, and 371 gold mine claims either bought or secured under option. As regarded Bulawayo, the town stands acquired by

them totalled 48, and their positions were very valuable. The claims were developing exceedingly well, and he read several results in which as much as 7 ounces 9 dwts. was won in some cases. Concluding, he said, by the amalgamation the properties they would possess would include 61½ freehold stands in Bulawayo, 36 freehold farms in Matabele, area about 360 square miles, 1651 gold claims, and shares in gold areas, &c. Altogether the affairs of the company were very promising, and it was a great stroke of fortune to have Mr. Cecil Rhodes taking up his residence in Rhodesia, as he would have considerable influence in the matter of railway construction and native labour—two very important items for them to consider. He proposed the first resolution, which was as follows:—"That the capital of the company be increased to £300,000, by the creation and issue of 100,000 shares of £1 each."—Mr. Grove seconded the resolution, and explained at some length the negotiations which he had conducted for Rhodesia with the Bulawayo Mining and Finance Company. At first the Bulawayo wanted £350,000 for their properties, but by negotiating with them he at last got them to accept £10,000 cash and £60,000 in shares. As to the value of the property he had obtained assays by an independent person, and these varied in the returns from 2 to 10 ounces per ton. Besides the intrinsic value of the property, he laid great stress on the personal support they would get from the gentlemen named by the Chairman if the amalgamation scheme were sanctioned. The prospects of Rhodesia, he thought, were very bright and glowing, and the fact that Mr. Rhodes had gone out there would add immensely to the value of the properties.—In the discussion that followed, a shareholder asked why, if the Bulawayo property was so desirable, were the company going to sell it.—Mr. Grove said it was because they had confidence in Rhodesia (Limited).—The resolution was carried unanimously.—The Chairman next moved:—"That the agreement now produced and read at this meeting for the purchase by the company of certain of the assets of the Bulawayo Mining and Finance Company (Limited) for £10,000 cash, and 60,000 fully-paid shares of £1 each in the capital of this company, be and the same is hereby sanctioned and confirmed, and that the directors be authorised to carry out the same accordingly."—Sir Charles Craford seconded the resolution, and it was carried.—Another resolution, authorising the directors to appoint any person approved by the other directors to act for them in their absence, was withdrawn, in consequence of opposition among the shareholders.—A vote of thanks to the Chairman concluded the meeting.

### THE SPITZKOP FARM GOLD COMPANY, LIMITED.

The ordinary general meeting of shareholders in this company was held yesterday, at Winchester House, E.C., the chair being occupied by Mr. WM. AUGUSTUS MITCHELL.

The SECRETARY (Mr. R. Norton-Dawson) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—It affords me much pleasure to meet and address you to-day, after having submitted to you our second annual report and accounts. We have not stated in our report the history of and detailed operations connected with the various drives and sections under development and workings, for, in a mining property such as ours, and in, indeed, all others, this can only be done for your appreciation by the aid of a large map—it is a matter to be followed mail by mail—so we have made our report into as concise and comprehensive a form as possible, so that you may be fully informed of our actual position and operations in as intelligent and easily digested a manner as possible. You will see an immense amount of work has been done, as also that we are most vigorously carrying on the developments. Naturally, shareholders' minds are absorbed in the one idea of a dividend, and it is a disappointment to us that we are not in a position to declare one for the financial year under discussion. We have had many things to militate against our doing so; still, I do not lose heart, for I can tell you most emphatically and decisively, our present position is better than it has ever been before; our finances are flourishing; our developments and workings are making splendid progress; and our prospects are of the most encouraging nature. I need scarcely touch upon the recent trouble in the Transvaal, for you will be as well acquainted with the question as I am. In our district, we have not felt any effect of the disturbance, excepting occasionally a scarcity of labour. Considering the prosperity of the South African Republic is due to the enterprise, industry, and capital of the Uitlanders, and is also essential for its future welfare, we may confidently anticipate an early termination of the difficulty, and I hope, by mutual forbearance and goodwill, a satisfactory basis will be arrived at. The mining industry in the Lydenburg district has claimed considerable interest in influential circles, and, in consequence, many companies have sprung up near our property, and I believe we are as well situated as any of them; added to this, we have got that valuable commodity, water. It may not be out of place to tell you I have been approached as to an amalgamation with one of the large companies, but owing to the trouble in the Transvaal, the question has dropped. I need scarcely tell you the board is keenly alive to the intrinsic value and position of our property, and so you may confidently rely upon us (in case any negotiations again come forward) that your interest will be safely guarded. Now as to the accounts: I do not know that any items call for remark; the item, registration fees, £158 6s. 6d. will not occur in the next year's accounts, and I trust law costs, £279 17s. 9d., will be conspicuous by its absence; the debit balance against the old company, £2031 18s. 8d., has been written off in accordance with the liquidator, particulars of which have been placed before you, and this item disappears for ever, although this year it presses somewhat unduly on the balance in this revenue account; the item, income-tax, £87 8s. 10d., we shall recover; the bonus voted at the extraordinary general meeting to the directors I must ask you to confirm to-day; at the same time I wish to say the directors were gratified for this slight recognition and unexpected acknowledgment of their hard work, the considerable amount of their time occupied, and the worry and anxiety over an unfortunate and unpleasant business. You will notice we any we have money in Consols—at the time of writing the report, it should read £10,000 in Consols face value, or stock—and £8000 in cash at the bankers, besides a most valuable asset in un-issued shares. The manager, in a recent letter, says: "I fully appreciated the motives which prompted your board to obtain an independent and unbiased report on the company's property. It is a step with which I am in, and trust it will result in good, and be of benefit to the whole concern. So far as I am personally concerned, I can say that for years I have had a difficult and uphill battle to fight; that your affairs have been running on the most economical and cautious lines it was possible to adopt, with a view of bringing the company to ultimate success. With regard to my report of September 30, 1894, it must be fully recognised that it was based on the data then procurable. No man can hold himself responsible for the accidents of mining, as it is essentially a venture, and if a reef does not prove as productive as anticipated it can only be looked upon as unfortunate. It is almost needless to repeat what is so well known—that we are only on the outside edge of the reef, and my opinion in regard to that is a matter of history. The mine now being opened will be the crucial test." So that I have only now to assure you that everything possible to ensure success is being done as rapidly and energetically as possible, and this will be manifest to you from the report, for although we

believe our manager is very able and doing his utmost, yet we determined to send an experienced mining expert from Johannesburg for him to consult, and to see if in any way more could be done to expedite and facilitate our operations, and you may rely upon it the board will leave no stone unturned to place the Spitzkop Farm Gold Company in the position we believe it must eventually occupy of being in the front rank of the successful mines of the Transvaal.

Mr. J. C. BAYLTON seconded the motion, which was carried unanimously.

The CHAIRMAN moved the re-election of Mr. J. C. Baylton, as a director of the company, saying that he had been upon the board during the time of the reconstruction, and ever since, and that the three directors upon the board had worked together in the most amicable manner. The re-election of Mr. Baylton would be taken as a vote of confidence in the board. (Hear, hear.)

Mr. C. B. HANCOCK seconded the motion, which was carried unanimously.

Mr. J. C. BAYLTON, in returning thanks for his election, endorsed the Chairman's statement that the board had always worked amicably together. The work which had fallen on the board during the past year had been extremely arduous.

The CHAIRMAN said the next business before the meeting was of rather a delicate and personal character. The directors were of opinion that they were not sufficiently remunerated, and they intended asking the shareholders to vote some additional remuneration. He, personally, was in the office practically every day, and he found the work was at times very irksome. At present the board received two guineas per attendance, and last year they received rather over £50 each.

Mr. HANCOCK moved a resolution, voting the board £100 each per annum extra. So far the directors had discharged their duties with great ability, and he did not think they should be allowed to remain out of pocket.

Mr. HARTLY seconded the motion, which was carried unanimously.

The CHAIRMAN, speaking in answer to Colonel STROUD, said the manager had led the board to believe that the last discovery would turn out to be much more valuable than the earlier ones. He himself had great confidence in the future of the property. He could hardly believe that if the properties round about the mine were so rich the gold would stop short at their boundary. He was thoroughly convinced there was gold in the mine, and felt confident that it would ultimately turn out to be one of the best mines in the Transvaal. Some of the reefs went 2 ounces to the ton, and that was the assay of the last discovery.

A SHAREHOLDER enquired whether the Chairman could give any approximate idea of how much ore there was in sight.

The CHAIRMAN replied in the negative. The latest return they had from the mill was 43 ounces, and from cyanide 106 ounces.

A hearty vote of thanks to the Chairman and directors terminated the proceedings.

### LADY FORREST (MURCHISON) GOLD MINE, LIMITED.

The statutory general meeting was held on Thursday, at the offices of the company, 37, Lombard-street, Mr. H. W. MAYNARD presiding.

The SECRETARY (Mr. James Blackwell) having read the notice convening the meeting.

The CHAIRMAN said: As you are aware, this is the statutory meeting of the Lady Forrest Gold Mine; but some of you may have been present at a previous statutory meeting of the Murchison Gold Syndicate, which is the parent company, and, as the interests are to some extent the same, I may have to go over the same ground. I will take as the text of the few remarks I have to make the last clause of the report written by Mr. Skerthby. In that report he says:—"You have a very capable manager in Mr. Doherty, who has a large and varied colonial experience, and you cannot do better than leave the mine in his charge, if he can be induced to take the superintendence of it. The mine has every appearance of being a permanent dividend-paying property, and has a large body of ore to work on. It also possesses good water, and its proximity to Cue and the railway renders the cost of working much lower than in many other mines in the vicinity." Since the meeting of the Murchison Gold Syndicate, to which I have referred, our position has somewhat advanced. We still have the greatest possible confidence in this mine as it is developed. The shafts are now down over 200 feet, and levels are being driven in various directions. As progress is made there is every possible indication that we have one of the best mines, certainly in this district, that we could possibly have hit upon. We have sufficient ground stopped already to supply a 20-stamp mill. The mention of the mill leads me to a little retrospect as to the position in which we find ourselves at the present moment. Mr. Skerthby, having gone out to the mine, was so impressed with the value and size—this latter is the great characteristic of the mine; the great quantity of ore that it possesses—that he came back to this country and strongly advised us to get a 20-stamp mill erected. That was, of course, a longer and a larger business, and in the meantime we determined to further test the property by making not merely a sample trial, but a large mill trial. We, therefore, made a contract with a local mill which seemed in a position to carry it out very well. We thought we should get 8000 tons through this mill under this contract, and everything seemed going on well; but there came an ill-fated day, when we heard that this mill could not carry out the contract. What recourse we may have against these people for damages—for it was a serious matter to us—is not yet settled, but we are keeping the question before us. Had that contract gone through as we intended, we should have had a very different story to tell you as to the actual position of affairs at the mine. Since then we have had another drawback in the loss of time due to the holidays. For many days no work was done, as the Christmas holidays intervened. However, I have a long list here, which those who have had experience in mining consider a very moderate one, of what Mr. Skerthby has purchased in the shape of machinery for the mine. We are promised by responsible and capable people that this machinery will all be ready for delivery three months from January 7. However, we shall do our level best to get the machinery up to the mine, *in situ*, and at work as quickly as we possibly can. In the meantime, our experience of the mine is remarkably good. The water question is solving itself in a very good way. I must confess that the whole of this Murchison district is more favoured in this respect than many of the adjoining districts of Western Australia. For instance, the question of water in this district gives nothing like the anxiety that it gives in some parts of Coolgardie, and in our case I do not think it will now prove a matter of any difficulty whatever. I do not think I have any more to say; but I shall be happy to answer any question any shareholder may like to ask. We have nothing whatever to hide from you. There is no suggestion of anything that has come short of the statements that were put forth either in the reports contained in the prospectus, or that I have at any time given you as to the prospects of the Lady Forrest Mine.

The CHAIRMAN, replying to a shareholder, stated that the scrip would be issued at the earliest possible date.

The meeting closed with a vote of thanks to the Chairman and directors.

### BLACK SWAN GOLD MINES (LIMITED).

An extraordinary general meeting of the shareholders in the Black Swan Gold Mines (Limited) was held on Thursday, at the offices of the company, 2, East India-avenue, E.C., when the resolutions passed at the previous meeting, held on January 27, reconstructing the company were confirmed.

THE YALGOO PUBLIC BATTERY AND GOLD MINING COMPANY (LIMITED).—A 10-head battery, with sufficient power to run an additional 10-head of stamps, winding machinery, hauling gear, and pumping plant have been ordered for shipment forthwith.



## SOUTH CROFTY.

Mr. F. HARVEY, J.P., C.C., occupied the chair at a five-monthly meeting of South Crofty shareholders, held on the mine, on Thursday.

The accounts, read by the PURSER (Mr. H. J. Lean), showed that the total expenditure had been £3480, of which £2363 was for labour, £1059 for merchants, and £57 for rates. The receipts had amounted to £2259, of which £2182 was obtained by the sale of 56½ tons of black tin, and £60 for arsenic. There was, therefore, a loss of £1220 on the five months, and the balance against the mine stood at £1056.

Captain JOSEPH THOMAS stated that when the water began to come into the mine from the east it was useless to keep the pump going, and that was stopped. About a fortnight ago all the miners left, as they were afraid of the water. At the present time the water was 5 fathoms above the 245 level. But for circumstances, over which they had not control, a strong company would have been formed months ago to explore the western part thoroughly by sinking a new shaft, and the employment of the most modern machinery. But that opportunity had, unfortunately, gone by. In that mine they were beaten, partially by the price of tin, and principally by the water being allowed to rise in the eastern mines, so that the whole body of water would in a very short time be flowing into South Crofty sett. Of course, there was a lot of ground upward that they had explored, but the committee would report what course they advised the shareholders to adopt. Whilst things were in the present unsettled state in the other mines they would scarcely think of working vigorously in the upper levels, whilst it was useless to continue working the pumping engine. That would be throwing money away, because they could not possibly cope with the water. For the present account they had only had three and a-half months' returns, against nearly five months' costs, so that the loss, on the whole, was hardly so much as he had expected.

The PURSER stated at the last meeting the call was made upon 5757 shares, there having been 363 relinquished previously. Since then 194 shares had been relinquished.

Mr. D. W. BAIN, J.P., C.C., seconded the motion, which was carried.

The CHAIRMAN moved:—"The committee having reported that the engine had been kept working until the 6th inst., and then stopped, the men fearing to continue working underground because of the water, that this meeting approves of the action of the committee, and, as to the future of the mine, leave the matter in their hands, to take such measures in respect of the mine as they may think best in the interests of the shareholders."

Mr. C. V. THOMAS seconded. He said it was unfortunate that they were in the position they now occupied. But it was satisfactory to know that they had not given up working the mine until compelled to do so through the unfortunate dispute of their neighbours. It was also clear that when the water got into their mine it was in a promising state. He thought it would be suicidal to wind up the mine. Wheal Agar and East Pool were resting on their oars, and there was no reason why South Crofty should not do the same. When those two mines began to work their neighbours would understand that South Crofty had to be reckoned with. They had a valuable sett in South Crofty which, if developed in the proper way, would make a successful venture. (Hear, hear.) And, inasmuch as if they suspended operations, the only cost would be a small one for somebody to look after the mine; nothing would be gained by winding up. The time would come when they would find their neighbours settling the dispute, and then, with or without them, South Crofty would be worked. He could not imagine anyone sending in relinquishments. If, however, they were sent in, it would be all the better for those who were left behind, because no cost was being incurred. (Hear, hear.)

Mr. D. W. BAIN supported and thoroughly endorsed what Mr. Thomas had said. He believed that their unfortunate position was wholly attributable to the unfortunate differences existing amongst the neighbouring mines. For some time he had felt the necessity of having a Court in Cornwall to which they might appeal in all matters of dispute. If the differences in the neighbouring mines had been referred some two or three months ago to a Court armed with power to act, the thing might have been expeditiously settled, and the South Crofty shareholders would have been able to meet under different circumstances. In his opinion such a court of appeal would be as much in the interests of the landlords as the shareholders, and he trusted they would pass a resolution similar to that passed by East Pool shareholders on Monday.

The CHAIRMAN fully concurred with the views expressed there and at East Pool meeting in regard to a court of appeal. They wanted some means of that sort to bring any dispute to a prompt and satisfactory end. They were, as all of them could see, suffering from the want of something of that sort at the present time. (Applause.)

Mr. BAIN moved a proposition similar to that approved by East Pool shareholders in reference to a court of appeal.

Mr. J. M. HOLMAN seconded. He said that if they had no court of appeal the mining industry of the county would become an utter wreck. The low price of tin they could not control, but the disputes were damaging their chances of doing anything with suitable capitalists. He thought a court of appeal ought to be established, and the sooner the better. (Applause.) A letter he had seen from Lord Robertes stated that his lordship had instructed his solicitor to act in regard to the Wheal Agar and East Pool sett as soon as possible. He hoped that would result in bringing about arbitration, or that the sett would be revoked. (Hear, hear.)

Mr. C. V. THOMAS supported the motion, which was carried unanimously.

A vote of thanks to the Chairman terminated the proceedings.

## WHEAL AGAR.

The following, under Monday's date, has been sent by Mr. Strauss to Wheal Agar shareholders:—"You are no doubt aware that the negotiations between the Wheal Agar adventurers and the East Pool adventurers have so far proved abortive, and in consequence relinquishments continue, and the prospects of the Wheal Agar Mine ever being worked again become daily more remote. At the last meeting of the shareholders of Wheal Agar a disposition was manifested by several shareholders present that an amalgamation should be effected with East Pool, and that the two mines should be worked jointly. At a subsequent joint committee meeting of the two mines this question was discussed, but the number of shares offered by East Pool and the number named by Wheal Agar were so far apart that there was no chance of a settlement. Considering that an amalgamation would no doubt prove an advantage to both mines, and that, if effected, the Wheal Agar shareholders would receive in exchange for their present holdings, which, as proved by the relinquishments, are of no market value, shares which are certainly marketable, and would probably be even more so after the settlement of the dispute, I proposed to the executive of both mines that they should amalgamate; that East Pool should issue a certain number of new shares to rank equally with the present shares; and that the number of such shares to be issued and given to the Wheal Agar shareholders for their sett be decided by arbitration, each side to name an arbitrator, who, in case of disagreement, are to refer to an umpire of their choosing. East Pool has agreed to my proposal, and I have put myself in direct communication with several members of the Wheal Agar committee, who, I find, are divided in their opinions. While all are willing to amalgamate, some are anxious to accept my proposal, while others are unwilling to submit to arbitration for reasons which are inexplicable. As there is an impression that if the Wheal Agar shareholders were consulted the majority would gladly accept arbitration on the basis of my

proposal, I now venture to ask you for your opinion, stating "Yes" or "No" on the enclosed circular; and should I find that the majority are ready for amalgamation, and believe that a man can be found in whose fairness they can trust, I may hereafter ask you to assist me further in my endeavours."

## EAST POOL.

A meeting of East Pool shareholders was held on Monday, Mr. J. R. Branwell presiding. The accounts showed a profit on the three months of £358.—The Chairman said they proposed to carry forward the balance to the reserve fund, making that now £4815, and proposed the adoption of the accounts.—Mr. T. Woolcock seconded.—Carried.—The Chairman, referring to the water question between Wheal Agar and East Pool, said there had been no progress made since the last account. They had to guard the interests of the shareholders as far as they could. Therefore, however popular would be the idea of voting away the mine and their interests, they dared not do more than was fairly reasonable from a business point of view. They had always been ready to do that. Six months ago they assented—they proposed, in fact, that the whole matter should be arbitrated upon. Mr. Hattersley disliked arbitrating on the matter, intimating that they had their own mine to dispose of, and that they would dispose of it at their own price. More recently, Mr. Strauss wrote him, saying that the Wheal Agar executive disliked that sett being severed from the proprietary altogether, and would prefer settling on the basis of the number of shares that East Pool should give for the Wheal Agar plant, and he asked him (the Chairman) whether he would agree to that. He did, but nothing had as yet come of it. Mr. Strauss was now going to all the shareholders of Wheal Agar, and he hoped he might be more successful with them than with the executive at that mine. He did not see that they could do any more at present than wait and see whether the efforts of Mr. Strauss or Lord Robertes or anybody else might have any effect in regard to the executive of Wheal Agar.—Captain Bishop said they were employing four boring machines, and were exploring a part of the mine which had been left idle, to a great extent, for a great number of years. They did not know what the result might be, but they were very satisfied with what they had so far developed.—Mr. E. G. Heard moved a resolution thanking the committee for deciding to leave it to arbitration, and leaving it in their hands as heretofore.—Mr. Juleff seconded, and it was carried.—The Chairman said a resolution had been drafted for submission to the meeting as follows:—"The position of matters as between East Pool Mine and Wheal Agar having been explained, it was resolved unanimously that the committee be empowered to enter into and conclude any negotiations with any necessary parties, and adopt any proceedings they may think advisable."—Mr. H. Rogers said he was glad to hear from Mr. Heard that he approved of the action of the committee.—Mr. James Wickett said they wanted to get a little backbone in the lords of the neighbourhood, especially Lord Robertes. Lord Robertes would have no difficulty in going to a Court and obtaining a revocation of the sett by showing that the whole of the neighbourhood was in danger, and that valuable property of his was in considerable jeopardy.—The Chairman said the following telegram had been received:—"To the Chairman of East Pool Mine, Carn Breu. I hope that at your meeting to-day you may think well to pass a resolution urging the advisability of a Court of Appeal being appointed to decide controversial matters between mine and mine, and mine and lords, and that with regard to your present dispute with Agar, if Agar continue to decline to submit the matter to reference, that Lord Robertes be once more begged to take action."—T. B. Bolitho. (Applause.) He moved:—"That this meeting deems it advisable that a court of appeal should be appointed to decide controversial matters between mine and mine and mine and lords."—Mr. T. Woolcock seconded the resolution, and it was carried unanimously.

## JUST-IN-TIME GOLD MINES (LIMITED).

The statutory meeting of the shareholders in the above company took place at Winchester House, E.C., on Saturday last.—Mr. S. D. Stoneham, who presided, stated that when they went to allotment in October their shares were over-applied for. Their property consisted of 61 acres, about 7 miles south-west of Marble Bar, and 150 miles from Condon, the nearest port. The Coongan river, however, was within 2½ miles, and gave them every hope of having a perpetual water supply, as they had a right to build a dam, and so create a pool. But before doing this it was their intention to sink a well, which their manager told them would at 60 feet supply 8000 gallons hourly—a little mistake he (the Chairman) thought. In the meanwhile, they were developing the property, and hoped shortly to inform the shareholders of the result of a trial crushing with a battery lent to them. They had not yet ordered any machinery, preferring to wait and be quite positive as to the kind they would require. When it was purchased there would be no difficulty in getting it there.—A vote of thanks to the Chairman concluded the meeting.

## DON PEDRO GOLD MINING COMPANY (LIMITED).

An extraordinary general meeting of the members of the Don Pedro Gold Mining Company (Limited) took place at Winchester House, E.C., on Monday last.—Sir Frederick Dixon Dixon-Hartland, Bart., M.P., presided, and, in moving resolutions for the reconstruction of the company and the registration of a new concern, to be named the Santa Anna Gold Mining Company (Limited), said nobody was more surprised than the directors to find that the Maquiné Mine would now only pay expenses, and would, probably, do so for some four months to come. Therefore, what the directors proposed to do was to recommend the shareholders to keep working the mine so long as it paid expenses, with a chance of some profit, and to make an immediate start with the Santa Anna Mine, which was worked as long ago as 1863, and then paid a dividend of 7½ per cent. on nine months' working. Since 1864 it had been closed on the belief that there was a more valuable property in Maquiné. However, on being opened last year, the works were found to be intact, and as good as ever. They proposed that Mr. Harvey, who had inspected the mine, and had had over 40 years' experience of quartz mining, should be their consulting engineer. As to the cost, 40 head of stamps to be worked by electrical power, all the necessary plant and expenses attached to opening the mine, when 20 head of stamps would be at work, would entail an outlay of between £15,000 and £16,000, of which £12,500 would be required the first year. To pay off debentures, &c., would take £7500, and, therefore, on a capital of 100,000 shares, 4s. per share would be required in the first year, and the remainder only as required, probably only 6s. They ought to begin crushing before the end of the year, and so pay expenses, while by next spring they should, with 60 stamps, be crushing 3000 tons a month. Having the results of the workings at the Oro Preto Mine to guide them, they were not groping in the dark in making their calculations. In fact, they considered that their results would be greater and obtained at a smaller cost. The only difficulty was the question of motive power, but this had been successfully met, and, therefore, he earnestly recommended them to adopt the resolutions which would enable them to work the Maquiné Mine only so long as it paid, and also to work the Santa Anna Mine. Concluding, he expressed the opinion that the directors had fully carried out their duty in making this proposal.—Mr. H. Tolpelt seconded the resolution, remarking that while there was great uncertainty with regard to the Maquiné Mine, they could confidently rely on the Santa Anna.—Mr. Harvey briefly explained the positions of both the Maquiné and the Morro Santa Anna Mines. The latter, he considered, could be opened and worked with very little expense, and he had found an ample water supply.—Considerable discussion

ensued in which a general complaint was made that the accounts for the half-year ended last June had not yet been audited, and Mr. Blundell proposed, as an amendment, that the report and balance-sheet be not passed until the accounts were made up to the end of the year 1895.—Mr. W. Jacob seconded the amendment.—The Chairman pointed out that this would cause considerable delay, and might mean ruin of the company's property.—Mr. Jacob withdrew as the seconder, but Mr. Blundell refused to do so, and another gentleman seconded his amendment, which, however, on being put, was lost by a large majority.—Ultimately a committee of five was appointed to confer with the directors, and afterwards to report to the shareholders on the present position of the company, and as to its future action.—The gentlemen appointed to serve on the committee were:—Mr. Parkendale, Mr. Miller Hooper, Mr. Jacob, Mr. Pallen, and Mr. Stephens, and the meeting was adjourned for a fortnight to receive their report.—The proceedings terminating with a vote of thanks to the Chairman.

## CASTNER-KELLNER ALKALI COMPANY (LIMITED).

The statutory meeting of this company was held at Cannon-street Hotel, London, on the 6th inst., Mr. W. Mather presiding.—The Chairman stated that since the company was constituted, the directors had secured a very eligible site for the erection of the works at Weston Point, on the estuary of the Mersey. The building of the works had commenced this week, the contracts were placed, and the erection would be pursued with the utmost diligence during the next few months. He saw no reason to alter the favourable view he had formed many months ago, and his colleagues shared that view. Their company did not stand alone in beginning this electrolytic process in connection with a large chemical industry. One of their largest shareholders was the Deutsche Solvay Werke Gesellschaft, the directors of it having been so far satisfied with the investigations they had made in the Castner-Kellner electrolytic processes that they had not only subscribed largely to the capital of this company, but had determined to erect works in Germany simultaneously with the works which were being erected in England. They thought it desirable, at present, to confine themselves to one-fourth of the plant ultimately contemplated, and to get such advantage as time and experience would give them in a few months before proceeding with the remainder.

## WHITE FEATHER "REWARD" CLAIM (LIMITED).

The first annual general meeting of shareholders in the White Feather "Reward" Claim (Limited) was held yesterday at Winchester-house.—Mr. Alfred Barrett, who presided, in moving the adoption of the report and accounts said that the nominal capital of the company was £80,000, of which £75,000 had been issued, leaving a reserve of 5000 shares. The purchase price of the "Reward" claim was £40,000, and that of the Golden Eagle blocks, acquired at the beginning of the year, £10,000. The value of the machinery and plant purchased to date was £10,037, and the cost of opening up and general development, £13,410. When it was remembered that the uncalculated capital amounted to £3106, that the cash in hand at the end of the first financial year was £5309 8s. 10d., and that they still had 5000 shares unissued, which the directors could easily dispose of, if necessary, at not less than £1 or 30s. premium, the shareholders would, no doubt, agree that the financial position, at least, of this company was highly satisfactory. The mine was opening up very satisfactorily, and with the efficient management at their command, there could be no reason why it should not soon become dividend-paying.—Mr. Mercer and Mr. Stoneham also addressed the meeting, speaking in high terms of the property.—The report and accounts were adopted, and the auditors reappointed.

The SUBSCRIPTION LIST will CLOSE on MONDAY NEXT, February 17, for both TOWN and COUNTRY.

THE NECESSARY WORKING CAPITAL HAVING BEEN GUARANTEED, THE DIRECTORS WILL PROCEED TO ALLOTMENT ON THE 17TH DAY OF FEBRUARY, 1896.

## HANNAN'S CONSOLIDATED GOLD MINES (LIMITED).

(HANNAN'S FIND, KALGOORLIE DISTRICT.)

Forty-eight Acres.

Registered under the Companies Acts, 1862 to 1890.

CAPITAL £150,000, in Shares of £1 each, Of which 50,000 SHARES are now OFFERED for SUBSCRIPTION AT PAR.

Payable: 1s. per share on Application, 4s. on Allotment, 5s. on 15th day of March, 5s. on 15th day of April, and 5s. on 15th day of May, 1896.

DIRECTORS.

D. W. WALES, Esq., Director of Cassidy Hill Coolgardie Gold Mines (Limited), Palmerston Buildings, Old Broad-street, E.C.

R. TERROT, Esq., Director African Pioneer (Limited), Woodstone Manor, Peterborough.

Major General BATES, Director of Finance Corporation of Western Australia (Limited), Goldsmith-avenue, Acton, Middlesex.

CHARLES B. PRUST, Esq., J.P., Director of Hannan's Excelsior Gold Mines (Limited), 167, Holland Road, Kensington, London, W.

CHARLES BRADLEY, Esq., Director of the Cassidy Hill Coolgardie Gold Mines (Limited), Leighwoods, Richmond, Surrey.

HANKERS.

London.—Messrs. BROWN, JANSSEN, and CO., 32, Abchurch Lane, London, E.C.

West Australia.—WEST AUSTRALIAN BANK, Perth, and Branches. (London Agents, 11, Leadenhall-street, London, E.C.)

SOLICITOR.

W. A. THOMSON, Esq., 3, West-street, Finsbury, London, E.C.

BROKER.

EDMUND BELLARS, Esq., 35, Bucklersbury, London, E.C., and Stock Exchange.

CONSULTING ENGINEER.

THOMAS COLLINGWOOD KIRTO, Esq., M.E., Cedar Lodge, Isleworth, Middlesex.

AUDITORS.

Messrs. GORDON and Co., Chartered Accountants, 4, King Street, Cheapside, E.C.

SECRETARY AND OFFICES.

W. A. LACK, Portland House, Basinghall Street, London, E.C.

ABRIDGED PROSPECTUS.

This Company is formed to acquire gold mining properties in the Hannan's District, Western Australia, comprising 48 acres.

The properties are situated within the proved auriferous belt, about two miles from the Hannan's Township on the Broad Arrow-road, and have three distinct reefs running through them.

They have been most carefully reported upon by the best known mining experts on the field, all of whom confirm their great value and excellent situation.

Application for shares should be made on, or in accordance with, the form enclosed in the Prospectus or that at the foot of this advertisement, and sent with the required deposit to the Bankers of the Company. If the shares allotted be less than the number applied for, the surplus of the amount paid on deposit will be appropriated towards the amount due on allotment, and where no allotment is made the deposit will be returned in full.

Prospectuses and Application Forms may be obtained at the offices of the Company, and also of the Bankers and Brokers.

This form can be sent with 1s. per Share application money to the Bankers, Messrs. Brown, Janssen, and Co., 32, Abchurch-lane, London, E.C., or to the Secretary of the Company, 71, Basinghall-street, London, E.C.

TO THE DIRECTORS OF THE HANNAN'S CONSOLIDATED GOLD MINES (LIMITED).

Gentlemen,—Having paid to your Bankers the sum of £..... as deposit of 1s. per Share on ..... Shares of 41 each in the above Company, I request you to allot me that number of Shares, and I agree to accept and pay for the same or any less number that may be allotted to me, and to pay the further instalments thereon as provided by the Prospectus, issued herewith, subject to the regulations of the Company.

Ordinary Signature.....

Name (in full).....

Address.....

Description.....



## NOTES ON THE ORE DEPOSITS OF THE MALAGA SERPENTINES (SPAIN).\*

By FRITZ GILLMAN (Member).

THE Malaga serpentines form a conspicuous feature in the wild scenery west of the Guadalhorce. Rising more or less abruptly to heights of 1000 to 1800 metres (say, 3300 to 5250 feet), their dark, reddish-brown surface, sprinkled with heather, contrasts clearly with the light greys of the surrounding dolomites which overtop them, while their more rounded contours are set off by the irregular craggy outlines of the latter.

In a geological map these serpentines are equally prominent, two of their masses constituting one-third of the total area south of Ronda, the largest, to the south-west, in the shape of a rough elongated ellipse, measuring about 41 by 16 kilom. (say, 25 by 9 miles).

Except where tertiary deposits overlie the older rocks in the proximity of the serpentine masses, these are surrounded by members of the Archaean and Primary series: cordierite and garnet-gneisses, mica-schists, clay-slates, limestones, and, last but not least, white, coarsely saccharoid, dolomitic marbles, which form entire mountain ranges (Sierras Blanca, Canucha, de Mijas, &c.), and are, in some places, quarried for building purposes.

In the midst of these formations (at what subsequent period is very uncertain), the mother-rocks of the serpentines were originally erupted; (I) in direction south-west to north-east from the latitude of Estepona to that of Ardales, a distance of 65 kilom. (40 miles), and (II) in an approximate west to east trend between Ojen and Benalmádena, a distance of 28 kilom. (17 miles). On the former line the outcrop is not continuous, the great mass of Sierra Bermeja, &c., terminates abruptly with the Sierra Parda; but beyond the much smaller mass of Yunquera a narrow band of serpentine indicates its connection with that of the Sierra de Aguas. Likewise several minor outcrops establish a connection between the masses of the Sierra Alpujata and the Sierra Gorda north-east of Coin.

The microscopic examination of a number of thin sections, in which undecomposed olivine and various members of the pyroxene group (diopside, diallage, bronzite, enstatite) are readily distinguished, points to peridotites, such as chertolite and harzburgite (saxonite), as the original rocks, which have become more or less serpentinised. The minor elements—magnetite, chromite, picotite, and pleonaste—are also present. Locally, the original rock was a dunite (Sierra Parda), as MacPherson pointed out, or an olivine norite (Tolox district); but, generally speaking, both on petrographical and chemical grounds, the writer cannot agree with Messrs. Michel Levy and Bergeron in considering norite to have been the chief original rock.

The serpentines, as they now stand, show signs of extensive weathering and superficial decomposition, but the indications of internal disturbance are far more striking. Not only has contraction on cooling developed the usual irregular jointing, but subsequent dynamical action, which has affected the country at large, has so fissured, dislocated and shattered the serpentine, that it would be difficult to quarry anywhere a solid block or slab of, say, one cubic yard. This general disturbance is particularly striking in driving an adit or sinking a shaft, when an advance of only 2 metres per month (with dynamite) will suddenly be followed by an advance of 12 to 15 metres in the same time with the sole aid of the pick, the rock in such case falling away in small pieces with conchoidal faces, polished or glazed by the friction undergone. This internal disruption is also very striking under the microscope, and considerably modifies the texture of the rock, just as chemical action has modified its colour; this varies, under ground, from the normal blackish-green to olive-green, and even light-gray.

In some localities the pyroxene constituents of the rock—especially bronzite—have separated out in the form of small masses and narrow veins; in others, veins of a gabbro or noritic character are met with. Again, irregular granitic veins of the aplite type, with tourmaline, have intruded through the serpentines, and in places veins of apatite-bearing pegmatite, with comparatively large crystals of biotite, form an irregular network following the joints and fissures of the main rock. Chrysotile is frequently met with in the fissures, though industrially of no importance, but in the neighbourhood of Ojen a small trade is carried on with steatite or soapstone, taken from the serpentine.

**Nickel Ores.**—About the year 1850 some oxidised nickel ore of the limonite or garnierite type, was discovered in the decomposed serpentine of Los Jarales, near Carratraca. Soon after, in view of the then high price of nickel, there was a local rush to the district, resulting in the excavation of many holes and the export of a few small shiploads of ore, the first of which went to Messrs. Elkington. Later on an Englishman took up some claim and started a blast furnace, which proved a failure. Afterwards similar ores were met with in the Sierra Alpujata, near Ojen, and then the New Caledonian discoveries having brought prices down, the Malaga "boom" ceased. Subsequently (1892) the writer was commissioned to study the district thoroughly; he worked there till the close of 1894, when the mines were abandoned as unprofitable.

The ores originally mined were secondary products resulting from the decomposition of those to be described presently, and consisted chiefly in green silicates of magnesia and nickel (with from 1 to 20 per cent. Ni) generally mixed with more or less chromic (chromic iron). They formed small, irregular masses and veins in the decomposed serpentine, alone or associated with decomposed norite (?) or augite. As a rule, these ore-veins constituted a species of network deposits of undefined outline, unlike anything that has come under the writer's notice, which had been simply quarried out and hand-picked, or roughly mined by means of irregular shafts (*trancadas*) and levels. In several instances these deposits had died out in all directions, leaving absolutely no trace of the ore, their dimensions varying from but few cubic yards up to many hundred. In other cases the deposits extended downwards below the water-level at which the "old man" had stopped.

Subsequent trials below the water-level and the decomposed area have shown, in the first place, that the original nickel area have shown, in the first place, that the original nickel mineral is almost invariably the arsenide, nickeline or niccolite (*Roth-nickelites*), and that it occurs in three distinct associations, which may be called:—

- The chromite type;
- The augite type; and
- The norite type.

A. The chromite type is a homogeneous, compact mixture of rough crystals, or more or less rounded grains of chromite (chromic iron) with nickeline, comparable to a sandstone in

which the sand is chromite and the cement nickeline. The texture is usually so fine that the two minerals can hardly be distinguished with the naked eye, their colours combining to produce a bronze tint. Sometimes the texture is coarser, the largest chromite grains being  $\frac{1}{16}$ th of an inch in diameter.

This ore forms irregular, lenticular masses and small veins, seldom more than a few feet in extent, and 4 to 5 inches thick, in the solid, fresh serpentine. But although, in many cases, the limit between ore and rock appears sharply defined to the unaided eye, the microscope reveals nothing like a "cheek" or "wall," much less a "selvage," but a close blending of ore and rock constituents. Minute fissures have broken across both, sometimes dislocating them, and display a chloritic or similar filling. The proportion of nickeline varies so, that one sample may contain 5 per cent., and another as much as 20 per cent. Ni (metal).

B. The augite type is characterised by dark, greenish-brown augite, in prismatic crystals, sometimes more than half an inch long, irregularly distributed and cemented together by pure nickeline, or by nickeline and chromite. The mixture reminds one of a porphyry, in which augite plays the part of the phenocrysts, and nickeline that of the ground mass. This ideal state of things is, however, comparatively rare, the augite, in veins or small, isolated masses, frequently bearing no ore at all, or only specks and minute aggregates of nickeline or chromite, or both.

The writer has continually looked for, but never observed, the slightest trace of ore in the pegmatite.

C. The norite type may be described as relatively fresh, metaliferous portions of otherwise highly decomposed, narrow and irregular norite (or gabbro?) veins in the serpentine. They form rounded, hard, and excessively tenacious kernels or nuclei, varying in size from that of a walnut to that of an ostrich egg, and consist of a granitic aggregate of plagioclase and pyroxene crystals, in and between which appear grains and aggregations of nickeline and chromite. In the richest specimens the nickeline constitutes a ground mass around the crystals; in the poorer ones the arsenide and the chromite are irregularly disseminated. In a few instances the two ores form irregular and more or less parallel string or bands, while in others the greater part of the rump or kernel is taken up by ore of the chromite type.

These three-ore types form separate deposits, although the common occurrences of chromite leads to type A being associated locally with types B and C. Type A, and, to some extent, type C, constitute irregular, not very intricate, network deposits of relatively limited area, completely isolated at different elevations or depths in the serpentine. Instances occur of type C forming single narrow shoots down to 50 yards beneath the surface. Type B has only been met with in little isolated masses and single, relatively constant, veins, of limited extent on strike (10—30 yards) dipping at high angles, and which the writer has followed down in one instance to 100 yards below the outcrop. At this depth the vein disappeared, after resolving itself into isolated fragments.

An interesting occurrence has been observed by the writer in the Jarales district, of a combination of the above-mentioned types, A and B, in which non-magnetic, ferrous, and cuprous sulphides predominate. In the massive ore these sulphides, nickeline and chromite, are intimately blended; less massive varieties show crystals of pyroxene and plagioclase (*i.e.*, labradorite) embedded in the ore proper, and as the ores diminish the silicates increase until they, in turn, preponderate.

Elsewhere, especially in Sierra Bermeja, north-west of Benahavis, the writer has found more or less nickeliforous and cuprous pyrites disseminated in minute particles throughout pyroxene veins, or forming small, isolated, massive ore bodies in the serpentine.

As to the genesis of these nickel-ore deposits, their peculiar mode of occurrence, coupled with the nature of their constituents and their isolation in a basic rock of eruptive origin, admit, in the writer's opinion, of but one interpretation—*viz.*, that they were formed by a segregation and concentration process in the original magma during its consolidation, the ores themselves (arsenide, sulphides, and chromite) being an integral part of the magma.

With regard to sulphide (nickeliforous pyrrhotite, &c.) this theory has lately been expounded in a masterly manner by Professor Vogt, of Christiania,\* who has also applied it to deposits of chromite in peridotites and allied serpentines.† Similar views have been expressed as to the nickel ores of Sudbry (Canada) by R. Bell‡ and Professor Poullon.§

**Iron Ores.**—The large serpentine mass to the south-west is characterised by its magnetite deposits. At a point called *El Robledal*, eastwards of Iguala, and 1350 metres (4500 feet) above sea-level, massive magnetite, several yards wide in places, crops out over half-a-mile in an east to west direction, and with a southerly dip of about 60°, between the serpentine and a band of decomposed gneiss which separates it from the neighbouring dolomitic marble. Of late years comparatively shallow trial workings have been conducted on this deposit in a haphazard way, with what result as to its value the writer is not aware, for when he visited the place in July, 1894, the underground workings were inaccessible.

Some 5 or 6 miles south-east of *El Robledal*, or 3 to 4 north-west of Istán, an apparently less important deposit of magnetite occurs in the midst of the serpentine of Sierra del Real. Its interest is, just now, mainly scientific, as will appear presently.

A third deposit, which the writer has not visited, occurs about 4 miles north-north-west of the seaport of Estepona, between serpentine and dolomite, and has been worked to some extent by its Spanish proprietors.

On the south-east border of Sierra Blanca, midway between Marbella and Ojen, and in close proximity to an offshoot of the serpentine mass of Sierra Alpujata, another magnetite deposit has been extensively worked for years by an English company. The ore, so far as it has been opened out, appears as a lenticular body, striking south-west—north-east, and dipping now east now west at very high angles, in what Michel Levy and Bergeron|| and with them T. D. Kendall¶ call "mica-schist and amphibolite." The French geologists describe the latter as consisting of amphibole, a little pyroxene and anorthite. That amphibolites (with plagioclase) occur with the gneiss and mica-schist of this region, the writer does not doubt; but none of the thin sections from two rock specimens brought away by him from the Marbella Mine contain any amphibole, the constituents being a little magnetite, a good deal of pleonaste olivine without a trace of serpentinisation, and an augite resembling diallage. The rock in question might, therefore, be classed as a picrite.

As for the ore itself, the authorities quoted above describe the impure varieties as a mixture of magnetite and amphibole. Of the four specimens taken by the writer, one certainly answers to this description; but the other three are made up of magnetite, augite, and olivine, the latter more or less serpentinised, or of magnetite and augite alone. Therefore, save in

one instance, the writer's specimens show a gradual transition from pure rock to pure ore, the pleonaste, which greatly preponderates over the magnetite in the rock, disappearing also as the iron increases.

The massive magnetite of *El Robledal* likewise contains minute crystals of pyroxene, and that of Sierra del Real is inclosed in serpentine; so that, taking these facts in connection with the occurrence at Marbella mine, the writer considers it probable that these magnetite deposits were originally formed by segregation from the surrounding periodotitic magmas, more or less on the lines set forth by Professor Vogt for certain iron ores of Norway, Sweden, and other countries.¶ This view, he submits, is more in accordance with their actual mode of occurrence and far easier to conceive than the "replacement" hypothesis advanced for them by Mr. Kendall.

\* *Zeitschrift für prakt. Geol.*, 1893, pp. 4—11; 1894, pp. 382—394; see also T. F. Teall, *Geol. Mag.*, February, 1892; and Dakyns and Teall, *Quart. Jour. Geol. Soc.*, 1891.

## NATIONAL ASSOCIATION OF COLLIERY MANAGERS, NORTH OF ENGLAND BRANCH.

A MEETING of the members of this association was held in the Lecture Theatre of the North of England Institute of Mining and Mechanical Engineers, on Saturday, February 8, Mr. W. WALTON BROWN (President) being in the chair.

Among the gentlemen present were Messrs. Thomas Bell, J. L. Hedley, G. F. Bell, and Wm. Leach (H.M. Inspectors of Mines), and Messrs. Hy. Palmer, M. H. Douglas, H. F. Bulman, Wm. Armstrong, jun., R. T. Swallow, John Hodgson, J. R. Gilchrist, A. C. Kayll (secretary), &c.

The President (Mr. Walton Brown) welcomed those present who were not members of the association, and trusted that they would soon become connected with the North of England branch. Mr. Brown then explained the objects of the association, and the many advantages which the members derived from their connection with it, mentioning specially that as the result of some arrangements lately entered into with an accident insurance company, all members of the association could secure a £1000 accident policy for an annual payment of £4, as against the sum of £6 paid by outsiders.

Mr. HENRY PALMER supported Mr. Brown's statements, after which Professor LOUIS, A.R.S.M., read his paper on "The Economics of Gold Mining." Professor Louis in his paper dealt with gold mining in its most recent developments, the subject of gold mining being of universal interest, owing to its object, "gold," being the universal standard of value. Before the discovery of America the amount of gold in the world was very small. It has been estimated at less than 30 million ounces. After the end of the 15th century better statistics are available, and it is estimated that from the 15th to the 16th century the output of gold in the world was nearly 250,000 ounces per annum, while at the present time the gold output would be from 9½ to 10 million ounces, or a total output since the year 1500 of about 425 million ounces of gold. After entering minutely into the fluctuations in the output of gold from 1500 up to the present time, Professor Louis then dealt with the modes of working employed in obtaining the precious metal both from the matrix and from the alluvial deposits. He pointed out that the origin of gold as it exists was a subject still involved in much obscurity. His opinion was that the gold was dissolved in the form of an alkaline aurate, although there was much to be said for the view that it might have been a soluble silicate; in either case the solutions were certainly alkaline, and carried with them a very large amount of dissolved siliceous matter. Accordingly all deposits of gold were characterised by the existence of quartz in very large proportions, quartz being, in fact, an invariable concomitant of gold. In all countries in which gold was found the conditions of its occurrence seemed to be practically identical as far as the mode of origin of the gold is concerned. It was interesting to learn that seven-eighths of the gold production of the world was produced in but four districts:—America, Russia, Australia, and the Witwatersrand. Each one of these districts had its own peculiarities. Professor Louis then dealt with their distinguishing characteristics, and stated that at the present day the South African practice was the best, the reason being that South Africa was the youngest gold field, and was thus able to benefit greatly by American experience, which had hitherto been the best. Professor Louis dealt more particularly with the Witwatersrand deposits as the conditions in which gold occurred there—*viz.*, in true beds, rendered their underground working comparable to that of many coal mining districts. Many diagrams and views were shown by means of an optical lantern to the gentlemen present at the meeting, and were fully described by Professor Louis. The modes of mining, the sinking of shafts and levels, the bringing of the ore to bank, &c., were matters also fully entered into and explained. The costs of mining were given in detail, and the different machinery for the crushing, &c., of the ore was described. The proportion of gold collected by the various processes in one of the best managed mines of the Witwatersrand was given as follows:—

Obtained by amalgamation .. .. .	69 per cent.
Obtained by concentration and chlorination .. .. .	9 per cent.
Obtained by cyanide process .. .. .	16 per cent.

Left in the tailings .. .. .	6
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Total available gold .. .. .	100 per cent.
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The cost of the above methods of treatment may be set down as follows, bearing in mind that in South Africa all calculations are made upon the very convenient short ton of 2000 lbs.:—

Cost of milling .. .. .	4s. 6d. per ton.
Concentrating and chlorinating .. .. .	3s. 3d. "
Cyanide process .. .. .	7s. 9d. "

Total .. .. .	15s. 6d.
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The above were fair average figures, but the items were subject to a good deal of variation in individual cases. Taking the value of the ore at £3, some 16s. must be subtracted for gold extraction, and this, with taxes, would run up to 25s., so that the value of the ore at the pithead would be about 35s. per ton. After deducting other charges and expenses, the profit might be put at 15s., or 25 per cent., and the methods of mining employed varied with the circumstances of the various mines. The magnitude of the mining operations might be best appreciated from the fact that in 1894 there were nearly 2,830,000 tons mined in a strip of land only 25 miles long and about a mile wide.

Professor LOUIS, in concluding his remarks, said that, owing to the nature of his subject, he had been unable to avoid going into numerical details, but he ventured to hope that, in spite of the inevitable dryness of this manner of treatment, the members would find something to interest them in it.

A hearty vote of thanks to Professor Louis, which was carried with acclamation, terminated the proceedings.

\* *Zeitschrift für prakt. Geol.*, 1893, pp. 125—143, and 257—264.

† *Ibid.*, 1894, pp. 394—395.

‡ *Bull. Geol. Soc. Am.*, 11 (1891), pp. 125—127.

§ *Jahrbuch K. K. geol. Reichsanstalt*, xlii (1892), pp. 276—302.

¶ *Mém. Acad. Sci., Paris*, vol. xxx.

|| *"The Iron Ores of Spain," Trans. Fed. Inst. M.E.*, vol. III, 1891—1892.

\* Paper read before the Institution of Mining and Metallurgy.

† "Étude Géologique de la Serranía de Ronda," *Mém. Acad. Sci., Paris*, vol. xxx.

‡ In shafts, winzes, levels and stopes the writer has excavated upwards of 2000 cubic metres, besides clearing some 400 metres of old workings.



## LIST OF REFINERS AND SMELTERS.

## COPPER.

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Broughton Copper Company (Limited), 122, Cannon Street, E.C.  
Crispin and Co., Marshgate Lane, Stratford, E.  
English and Australian Copper Company (Limited) (W. R. Caldwell Moore, secretary), 135 and 137, Palmerston Buildings, E.C.  
Lambert, Charles and Co., Leadenhall Buildings, E.C.  
Lambert, Druce and Co., 74, King William Street, E.C.  
New Tinto Company (Limited) (George N. Thomson, secretary), 30 and 31, St. Elio Lane, E.C.  
Smith's Lane, E.C.  
Sheffield Smelting Company (Limited) (Thomas H. Morton, London manager), 1, Berry Street, Clerkenwell Road, E.C.  
Vivian and Sons, 31, Bond Court, Walbrook, E.C., and Limehouse Hole, E.C.  
Vivian and Sons, 10, Laurence Pountney Lane, E.C.  
Vivian, Foster and Co., and Pascoe Grenfell and Sons (Limited), Leadenhall Buildings, E.C., and 27, Upper Thames Street, E.C.  
**Country**—  
Baxter, Henry (John Ingram, agent), 20, Easy Row, Birmingham.  
Baxter, Henry, Fox Copper Works, St. Helena, Lancashire.  
Bede Metal and Chemical Company (Limited) (W. M. Brown, secretary); Works—Hebburn, R.S.O., Durham.  
Bibby, John, Sons and Co., Garston Copper Works, Garston; Liverpool and Salford, Salford Works, St. Helena.  
Bolton, Thomas and Sons, Froggall Copper Works, Froggall, Stoke, Staffordshire; Mersey Copper Works, Widnes, Lancashire, and 16, Broad Street, Birmingham.  
Broughton Copper Company (Limited), Broughton Copper Works, Manchester.  
Cape Copper Company (Limited), Briton Ferry Copper Works, Briton Ferry, Glamorgan.  
Dennis, J. H. and Co., Cornubia Works, Widnes, Lancashire, and 3, Castle Street, Liverpool.  
Elliott's Metal Company (Limited), Pembrey Copper Works, Burry Port, R.S.O. S. Wales; 23, Colmore Row and Selly Oak Works, Birmingham; 9, Irwell Street, Liverpool, and 14, Brown Street, Manchester.  
Elmore's Patent Copper Refining Company (Limited) (James Shurmer, secretary), Pontefract Road, Hunslet, Leeds.  
Glasgow Metal Refining Company (John Shields, proprietor), 54½, King Street, Glasgow.  
Hills, Henry and Son, Amble, Port Alwiche, R.S.O., North Wales.  
Hills, Henry and Son, Anglesey Copper Works, Low Walker, R.S.O., North Wales.  
Lambert, Charles and Co., Port Tennant Copper Works, Swansea.  
Lancaster Copper Company (Limited), Lancashire, R.S.O., South Wales.  
Liverpool Silver and Copper Company (Limited) (The), West Bank, Widnes, Lancashire.  
Lodge and Co., Birkenhead Dock Copper Works, Birkenhead.  
MacKinnon, R. W. and Son, 110, Great Wellington Street, Kinning Park, Glasgow.  
Mason and Barry, Wallsend, R.S.O., Northumberland.  
Mona Mining Company (Thomas Fanning Evans, proprietor), Alwiche, R.S.O., Anglesey, North Wales.  
Morris and Co., 12, Priory Place, Doncaster; works, Stockwith-on-Trent, Gainsborough.  
Newell, Druce and Co., Llanelly, South Wales and 24, Exchange Alley, Liverpool.  
Newton, Kates and Co. (Agent John A. Fielding), Central Copper Office, 4, Whitworth Street, London Road, Manchester; 28, King Street, and 3, Cooper's Row, Liverpool; Sutton, St. Helena; Greenfield, Holywell, North Wales, and Broad Street, Birmingham.  
Pas, C. and Son, Bedminster Smelting Works, Mill Lane, Bristol.  
New Tinto Company, Limited (G. N. Thomson, secretary), Glamorgan Metal Works, Jarrold-on-Tyne and Gwamston, Port Talbot, Glamorgan, South Wales.  
Roberts, William, Brookland Copper Works, St. Helena, Lancashire.  
St. Helena Copper Company, Limited (William J. Thomson, manager), Old Evenhead Works, St. Helena.  
Stephens, James, Black Vale Copper and Tin Smelting Works, Swansea.  
Tharal Sulphur and Copper Company (Limited), Hebburn, R.S.O., Durham; Lugsdale Road, Widnes, Lancashire; East Moor, Cardiff; 29, Colmore Row, Birmingham; registered offices (David Barlas, secretary), 135, West George Street, Glasgow.  
Vivian and Sons, Hafod Works, Swansea; Morgan Copper Works, Port Talbot, South Wales; 2, Cathcart Street, Greenock; 70, Prince Street, Bristol; 7, St. Peter's Square, Manchester; 4, Crooked Lane, Liverpool, and 46, George Street Parade, Birmingham.  
Wilkes (John), Sons and Mapplebeck (Limited), Abberley Street, Birmingham.  
Williams, Foster and Co., and Grenfell Pascoe and Sons (Limited), 17, Irwell Chambers, Liverpool; works, Morfa Copper Works, Llandudno, Swansea.  
**Ireland**—  
Vivian and Sons, 61, Lower Gardiner Street, Dublin.

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Clark, Frederick A. and Son, Phoenix Lead Mills, Marlborough Wharf, Hammersmith, W.  
Enthoven, Henry John and Sons, 17, Gracechurch Street, E.C., and Upper Ordinance Wharf, Rotherhithe Street, S.E.  
Lane, Sons and Co. (Limited), Old Shot Tower Works, Commercial Road, Lambeth, S.E.  
Newell, Druce and Co., 74, King William Street, E.C.  
Waters, B. C. and Co., Billiter Buildings, E.C., and 58, West Ferry Road, E.  
**Country**—  
A. D. Mining Company, Limited (Simon Cherry, agent), Fremington, Richmond, Yorks.  
Alkaline Reduction Syndicate, Limited (The), Hebburn, R.S.O., Durham.  
Cockhill and Sunnyside Lead Mines (Hutchinson and Williams proprietors), Fatsley Bridge, Leeds.  
Cookson and Co., 1, Wellington Quay, R.S.O., Northumberland, and Bank Chambers, Sandhill, Newcastle-on-Tyne.  
Llanammet Smelting Company (Limited), Llanammet, Swansea.  
Locke, Blackett and Co., Wallsend, R.S.O., Northumberland.  
London Lead Company (Limited) (Thomas Stoddart, manager), Egglestone, Darlington, and (John Joseph Millican, manager) Middleton-in-Teesdale, Darlington.  
Mill Dam Mining and Smelting Company (J. B. Wostenholme, secretary, Leonard Malby, manager), Great Bucklow, Cheshire.  
Moore, J. H., Brough Works, Hope (Sheffield), Derbyshire.  
Newell, Druce and Co., Llanelly, South Wales, and 24, Exchange Alley, Liverpool.  
North Wales Lead Works (Limited), Mann Island, Liverpool, and at Holywell, Flintshire.  
Panther Lead Smelting Company (Limited) (James B. Clark, manager), Avon Street, St. Philip's, Bristol.  
Pas, C. and Son, Bedminster Smelting Works, Mill Lane, Bristol.  
Quirk, Barton and Burns, Smelting Works, St. Helena and Orange Court, Castle Street, Liverpool.  
St. Cathbert Lead Smelting Works (Thomas Wilcox, manager), Priddy, Wells, Somerset.  
Scargill Lead Mining and Smelting Company (Limited), 35, Westgate Road, Newcastle-on-Tyne, and Scargill (Barnard Castle), Yorks.  
Sheldon Bush and Patent Shot Company, Crew's Hill, St. George, Bristol, and Chace Lane, St. Philip's, Bristol.  
Stephens, James, Black Vale Copper and Tin Smelting Works, Swansea.  
Stoney Groves Company (David Williams, manager), Fatsley Bridge, Leeds.  
Vivian and Sons, 7, St. Peter Square, Manchester, and 1, Cathcart Street, Greenock.  
Walters, Parker and Co. (Limited), Bagillt Lead Works, Bagillt, Holywell, North Wales; Lead Works, Chester, and 6, Mann Island, Liverpool.  
Walton, Robert, Stanhope House, Stanhope, Darlington.  
Wass and Son, (trustees of) John Miers, manager of smelting works, Lea, Cromford, Derby, and (Anthony M. Alsop, agent), South Darley, Matlock Bath, Derbyshire.  
W. B. Lead Office (Wentworth Blackett Beaumont, proprietor; James M. Fothergill, manager), Allen Smelting Mill, and Newcastle Mine, Allen, Herefordshire, R.S.O., Northumberland.  
Wendle Lead Company (Limited), Killhope and Sedling, Cowshill and Rookhope, Darlington.  
**Ireland**—  
York Thomas Ed., Heathfield Smelting Works, Fatsley Bridge.  
**MacLachlan and Ross, Abercorn Basin, Belfast.**

## TIN.

**London**—  
Beltho, Thomas and William, 39, Lombard Street, E.C.  
East Tregebo Mine, 3 Great Queen Street, S.W.  
Redruth Tin Smelting Company, Golden Heart Wharf, Dowgate, E.C.  
**Country**—  
Consolidated Tin Smelting Company (Limited), The (Thomas Willis Field, managing director), Ohyandour, Trevelin, Penance, and Carvedras, Truro.  
Cornish Tin Smelting Company (Alfred Lanyon, acting partner), Redruth, Cornwall.  
Reape, J. G. and T. (agents), Leeds Old Lead Works, North Street, Leeds.  
Roe, W. P. and Co., 78, 11, and 12, Lawley Street, Birmingham.  
Roe, O. and Son, Bedminster Smelting Works, Mill Lane, Bristol.  
Rospell Tin Smelting Company (Limited), Thomas Tague, manager, Devoran, R.S.O., Cornwall, and (Henry Bath and Son, agents), 18, Chapel Street, Liverpool.  
Footley, Richard, 55½, Hurst Street, Birmingham.  
Redruth Tin Smelting Company, Redruth, Cornwall.  
Stephens, James, Black Vale Copper and Tin Smelting Works, Swansea.  
Sutton, Thomas B. and Son, Neath, South Wales.  
Tamar Tin Smelting Company (Limited), J. F. Pagen, managing director, 1, Courtenay Street, Plymouth.  
Williams, Harvey and Co., Mellanear, Hayle, Cornwall.

## ZINC.

**London**—  
Boden and Co., 5, Wood Street, Westminster, S.W.  
Hillier and Co. (J. H. Seeger), 21, Mincing Lane, E.C.  
Norwegian Zinc Company, Limited (Charles G. Holland, secretary), 41, Gresham Street, E.C.  
**Country**—  
Central Metal and Smelting Company, 10, Carrick Street, Glasgow.  
Dillwyn and Co., Swansea.  
English Crown Smelter Company, Port Tennant, Swansea.  
Hendeb and Tynedale Lead and Zinc Company (Limited); offices, 4, St. Nicholas Buildings, Newcastle-on-Tyne.  
Scott, F. B. and Son, 67, Victoria Street, Liverpool.  
Vale Smelting Company, Swansea.  
Vielje Montagne Zinc Company; (Mies and warchilds, 87, Victoria Street, Avers).

Villiers Spelter Company Limited (Thomas Freeman, managing director), Swansea.  
Vivian and Sons, Morriston Spelter Works, Swansea.  
William Foster and Co., Swansea.

## ANTIMONY.

**London**—  
Hallett and Fry, Norway Wharf, 202, Rotherhithe Street, S.E.  
Johnson, Matthey and Co. (Limited), Hatton Garden, E.C.  
Liza Mining Company, Limited (Knowles and Co., agents), Billiter Square Building, E.C.  
Merton, H. R. and Co. (merchants), 2, Metal Exchange Buildings, E.C.  
Morris, Kekewich and Co., 70, Gracechurch Street, E.C.; antimony dealers and importers.  
Pratt, J. J. and Son, 79, Queen Street, E.C., and 355, Kingsland Road, N.E.  
Smith, Alexander (dealer), 6, Holborn Circus, E.C.  
Wright-Barton, E. W. and Co., 355, St. Leonard's Road, Bromley, E.  
**Country**—  
Cookson and Co., Bank Chambers, Sandhill, Newcastle-on-Tyne; works, Wellington Quay, Newcastle-on-Tyne.

## NICKEL AND COBALT.

H. H. Vivian and Co. (Limited), Swansea.  
Hy. Wiggan and Co. (Limited), Birmingham.

## SOUTH AFRICAN MINES' OUTPUT FOR JANUARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.
African Gold Recovery...	68,100	64,000	61,500	65,500	—	—
Appantoo .....	—	—	—	—	—	348
Barrett .....	283	274½	815	805	546	—
Block B .....	3,581	3,594	3,606	3,418	2,690	2,548
Buffelsdoorn .....	3,361	3,188	2,049	2,716	4,011	3,625
Champ d'Or .....	4,516	3,776	4,005	3,823	—	—
City and Suburban .....	10,216	8,381	8,597	8,225	8,036	6,308
Crown Reef .....	11,531	11,385	11,100	11,448	10,729	8,890
Durban-Rodepoort .....	6,006	6,089	6,318	6,222	4,710	3,812
Eastleigh .....	2,166	1,994	2,042	2,150	1,413	1,950
Ferreira .....	7,011	7,439	7,740	8,116	11,050	9,879
Forbes Reef .....	99	75	—	68	109	118
Graskop .....	—	—	—	—	144	129
Geldenhuis Deep .....	—	—	—	3,698	3,190	3,382
Geldenhuis Estate .....	7,788	7,236	6,898	6,532	5,099	2,430
Geldenhuis Main Reef .....	2,163	2,088	1,835	1,924	2,052	1,747
George and May .....	173	—	—	—	—	—
George Goch .....	3,099	3,361	3,244	3,190	3,355	2,278
Ginsberg .....	813	851	857	768	679	813
Glencair Main Reef .....	5,209	4,096	1,955	6,159	5,364	3,163
Henry Nourse .....	4,210	4,562	4,724	4,847	5,021	3,616
Joe's Reef .....	331	150	230	258	205	199
Johannesburg Pioneer .....	2,692	2,507	2,668	2,762	—	—
Jubilee .....	2,707	2,727	2,176	2,334	2,689	2,238
Jumpers .....	7,079	6,497	6,355	5,957	4,960	3,104
Lancaster .....	344	318	348	314	234	—
Langlaagte Estate .....	11,472	11,081	11,055	10,740	9,679	9,058
Langlaagte Royal .....	329	—	—	—	—	—
Lisbon-Berlyn .....	522	640	644	692	653	808
May Consolidated .....	6,030	6,032	5,604	5,738	5,299	5,008
Metropolitan .....	2,173	1,981	1,916	1,621	—	—
Meyer and Charlton .....	3,745	3,642	3,358	2,885	3,264	2,437
Minerva .....	—	—	—	1,695	1,139	1,300
Moodies .....	184	515	317	300	309	—
New Chimes .....	2,459	2,431	2,370	2,363	—	—
New Clower Estate .....	1,479	—	1,473	2,223	1,381	1,573
New Comet .....	—	—	—	2,971	2,327	2,430
New Cross .....	3,084	2,851	2,766	2,734	2,175	2,020
New Harlot .....	5,738	5,998	5,803	5,735	5,326	3,825
New Kleinfontein .....	2,829	2,631	2,608	2,519	2,552	—
New Midas .....	499	—	—	—	—	—
New Primrose .....	12,206	11,418	11,584	12,023	9,553	9,026
New Rietfontein .....	2,328	2,448	2,162	2,289	1,904	2,076
Nigel .....	3,724	2,658	2,550	2,613	2,844	2,074
Orion .....	3,700	871	1,850	2,500	2,900	2,111
Paarl Central .....	3,138	3,083	2,330	1,932	404	—
Porges-Randfontein .....	4,114	3,921	3,821	2,515	2,617	1,792
Princess Estate .....	2,150	2,000	2,100	2,024	1,334	1,523
Robinson .....	15,935	17,294	17,371	16,367	16,024	12,281
Rodepoort United M.R. .....	2,450	4,691	4,823	4,719	3,625	3,837
Salebba .....	2,450	3,043	3,000	2,550	2,450	2,100
Sheba .....	4,807	5,842	6,980	6,563	6,602	10,010
Simmer and Jack .....	7,543	7,783	7,786	7,786	8,302	6,319
Spitzkop .....	269	571	823	242	199	211
Stanhope .....	1,000	870	960	1,000	730	—
Sutherland Reef .....	763	593	598	594	229	124
Transvaal Gold .....	3,075	3,175	2,550	2,550	2,625	2,475
United Langlaagte .....	2,297	2,316	2,164	1,845	1,143	—
Van Ryn .....	2,896	2,920	3,128	2,624	2,406	2,334
Violet Consolidated .....	—	—	—	304	—	—
Wemmer .....	7,699	7,119	6,641	6,457	6,075	5,361
Wolhuter .....	2,420	4,715	5,240	5,435	5,527	3,216
Worcester Exploration .....	2,092	1,829	1,922	2,031	1,971	2,050

## DIAMONDS.

	Carats.	Carats.	Carats.	Carats.	Carats.	Carats.
Koffyfontein .....	2,320	2,275	3,450	3,750	3,800	—
Un. Mines, Bultfontein .....	—	—	—	—	—	6,000

## COAL.

	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Cassal Coal .....	20,635	21,500	23,537	24,105	24,100	15,880
Great Eastern .....	—	—	—	—	—	11,400
Transvaal Coal Trust .....	31,400	28,300	31,000	32,100	29,400	—

a Battery stopped eight days. b 60 stamps. c 10 stamps. d 50 stamps. e 22 days. f 22 days. g 12 days. h 13 days. i 15 days. j 17 days. k 25 days. l mine closed 14 days.

The following are the profits or losses (the latter being indicated by a \*) made by South African mining companies:—

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
	£	£	£	£	£	£
City and Suburban .....	7,773	6,580	8,080	4,750	4,560	—
Crown Reef .....	14,823	15,125	14,367	15,213	12,192	—
Geldenhuis Estate .....	10,800	10,000	6,500	4,500	1,996	3,700*
Geldenhuis Main Reef .....	3,342	3,074	1,882	2,161	2,847	2,050
George Goch .....	2,627	4,093	2,492	3,247	—	—
Glencairn .....	7,758	8,009	—	10,835	7,682	2,167
Jumpers .....	10,900	10,370	9,500	7,500	4,337	2,000
May Consolidated .....	7,369	6,691	6,360	6,606	6,000	—
Metropolitan .....	538	279	—	—	—	—
Meyer and Charlton .....	5,570	5,950	4,271	2,138	3,708	646
New Chimes .....	2,574	2,415	2,095	2,152	—	—
New Clower .....	1,000	—	—	—	—	—
New Harlot .....	9,691	11,418	9,350	10,031	—	—
New Primrose .....	17,506	14,500	14,667	16,047	6,675	5,730
New Rietfontein .....	1,607	2,610	1,818	1,832	—	—
Orion .....	6,700	—	—	—	—	—
Princess Estate .....	1,230	1,399	1,669	1,675	—	—
Robinson .....	34,500	39,500	39,500	34,000	35,000	19,000
Rodepoort United .....	7,772	8,630	8,320	7,850	4,100	4,000
Simmer and Jack .....	10,449	12,848	10,778	11,044	11,032	—
Transvaal Gold .....	4,025	4,095	3,125	3,045	2,915	2,910
Van Ryn .....	1,887	3,089	3,903	2,396	1,482	—
Wemmer .....	14,917	14,025	11,057	11,380	10,698	—

## DIAMONDS.

	Carats.	Carats.	Carats.	Carats.	Carats.	Carats.
Un. Mines, Bultfontein .....	—	—	—	—	—	2,000
Cassal Coal .....	3,580	4,250	4,400	4,750	4,550	1,060
Great Eastern .....	—	—	—	—	—	1,300
Transvaal Coal Trust .....	5,300	3,300	4,300	4,600	3,000	—

a Mine closed two weeks.

A NEW OPAL MINE.—In a basaltic formation in Idaho U.S.A., some men who were digging a well recently discovered an opal mine, the gems from which are said to stand second only in value to those from Hungary.

## SALT INDUSTRY OF VENEZUELA.

SALT is one of the principal products of Venezuela, and a considerable trade is carried on in its production and exportation. The salt-pans are situated along the shore, and were formerly in charge of the Government of the several States; but in the year 1873 they conceded their rights over them to the Federal Government for a certain annual sum in proportion to the amount produced by each. The Government administered the works for a time with its own employes, but afterwards made contracts with private individuals for carrying on the same, with the understanding that they should pay the sum of 4,500,000 bolivars (about £170,000) for each six years. This system was abandoned as unprofitable, and a superintendent of works was named, who had to deliver to the Government 50 per cent. of the money received, retaining the balance for his expenses and profit. In March, 1893, the Bank of Venezuela took charge of the industry as general administrator for the Government, receiving as a commission 10 per cent. of the net proceeds. The United States Secretary of Legation at Caracas says that the principal salt works of the Republic are situated in the section of Nueva Esparta (Island of Margarita), Cumana, Barcelona, Maracaibo, and Coro. To the islands of Nueva Esparta belong the most important works at Coche, which are the largest, and at Pampatar. The Coche works are on the island of that name, which was formerly famous for its pearl fisheries. The pans measure 1544 metres in length, by 820 metres in breadth, and are 1 metre in depth. They are separated from the sea by a strip of land 800 metres broad, crossed by a channel for the introduction of sea water. In January and February the crystallisation begins, and in March and April the collecting of the salt takes place, the crust then being about 10 centimetres in thickness. This work lasts for five or six months. At Pampatar the pans measure 2000 by 600 metres, but the product is inferior to that of Coche, and the pans are not in operation. The works in the section of Cumana, the second of importance, are at Araya, and are very large, measuring about 5 kilometres (3.16 miles) in length by 1 kilometre in breadth, being a natural depression, which has been worked since the discovery of the Continent, and, it appears, by the Indians in pre-Columbian times. The Spaniards had several fortifications here, which were attacked on various occasions by the English and Dutch. The salt is rather dark in colour, but is reputed to be of a very good quality. A short distance from Carupano there are the salt works of Arco, producing a salt of fine quality. This pan has, however, been abandoned, on account of its small production. On the coast of Baracoa there are several works of little importance, the larger ones being at Unare and Casanare. In the section of Maracaibo there are a great number of pans, some of them being private property, the owners of which are obliged to submit to the conditions fixed by the Government for the sale of salt. In the State of Falcon are to be mentioned the works of Los Tague, Mitare, and El Guarano, while at many points the salt is not even collected. Finally, in the State of Carabobo there are several places where salt is collected, Guigara producing a very white and good article that has occasionally been exported. The annual production of salt amounts to about 18,000,000 kilogrammes. Salt is sold at the several works through a permit issued by the Custom House, at the rate of about 3d. for every 2 lbs., when for home consumption, and at a very much lower rate when for export, which, however, takes place only to Colombia. The whole population of the Republic of Venezuela being about 2,500,000, and the annual production of salt, as shown above, to be about



## LATEST FROM THE MINES.

## CABLEGRAMS AND TELEGRAMS.

**AGNES BLOCK.**—Extract from manager's letter dated January 17: "I am now stoping in No. 2 winze, and hope the tenour of the quartz will be better. Panning from this stoppe give about 7 to 8 dwts. free gold without cyanide."

**APPANTOO GOLD.**—During January mill worked 20 days; crushed 700 tons, yielding 348 ounces of gold. This smaller return was caused through accident to mill boiler, which is repaired.

**BARRETT GOLD.**—January gold return 550 ounces. (December 546 ounces).—Official Note. Written advices to hand, dated January 11, say that owing to the political scare the Kaffirs could not be induced to work during the first week, but confidence was gradually being restored and work resumed in all departments at time of writing. Wet weather continued, and some difficulty was being experienced in consequence in sieving a sufficiency of ore for the cyanide works. Large ore shelters were, however, in course of completion, and three additional cyanide vats being erected, which would enable a considerably larger quantity of ore being dealt with monthly.

**BLOCK B. LANGLAAGTE ESTATE.**—Production for January. By cable:—"Mill. Ore crushed, 6987 tons of 2000 lbs.; gold returned, 1810 ounces.—Tailings, cyanide process. Tons treated, 3440 of 2000 lbs.; gold recovered, 423 ounces.—Concentrates, cyanide process. Tons treated, 176 of 2000 lbs.; gold recovered, 316 ounces; total gold recovered, 2548 ounces."

**BROKEN HILL PROPRIETARY.**—The following cable from the head office is to hand:—"6105 tons treated, yielding 456 tons lead, containing 114,900 ounces silver, also 1547 tons treated by A. and L. Plants, containing 5547 ounces silver." The manager telegraphs that explanation of low returns is as follows:—"That some further movements have recently taken place in areas effected by creeps, and in interest of property it is not considered advisable at the present time to force output from the pillars of rich ore so that movements may not be intensified. The price of the shares in Melbourne is £2 12s. 6d. buyers."

**BROKEN HILL PROPRIETARY.**—The following cable was received from Melbourne on February 11:—"Shares, £2 18s. 6d., buyers."

**BUFFELSDOORN ESTATE AND GOLD MINING.**—The London agents announce receipt of the following cable:—"Production for January 3625 ounces; 70 stamps, 29 days."

**CASSEL COAL.**—A cablegram received gives the output for the month of January as 15,880 tons; profit, £1000. The considerably reduced profit is in consequence of feeding and paying natives during period mine was closed (first two weeks of month).

**CAYLLOMA SILVER.**—A cable has been received from the manager, reporting January production 9250 ounces fine silver in ores shipped, and 6250 ounces fine in bullion.

**CHARTERS TOWERS CONSOLIDATED.**—Cablegram received from local directors, Charters Towers:—"Have struck new reef, measuring 1 foot wide, at a vertical depth of 90 feet; ore contains visible gold; we continue sinking."

**CHIAPAS.**—Copy of cable received from the mine February 8:—"During January the concentrating mill ran 23 days; 1450 tons of ore were crushed, yielding 66 tons of concentrates. The stamp mill ran 36 days (including part of December), and crushed 714 tons of tailings, yielding 181 ounces gold."

**CITY AND SUBURBAN.**—Last month's crushing yielded 6308 ounces.

**CUMBERLAND.**—A cablegram received from the mine announces:—"Tailings works recovered 153 ounces from 238 tons, at a cost of £330. The estimated value is £350."

**DAY DAWN BLOCK AND WYNDHAM.**—The following cablegram was received from the general manager at Charters Towers, on February 11, giving the result of the crushing for the fortnight ending the 8th instant:—"Tons crushed, 1021; yield of gold, 1062 ounces; approximate value, £3665; fortnight's expenses, £1760."

**DAY DAWN BLOCK AND WYNDHAM.**—Bullion ex s.s. *Duke of Devonshire* sold for £10,574 17s. 4d.

**DE LAMAR.**—The following is the cabled return for the month of January: "Crushed during the month 4223 tons. Bullion produced in the mill, \$68,098; estimated value of ore shipped to smelters, \$5500; miscellaneous revenue, \$340; total produce \$73,938, total expenses \$43,845. Profit for the month of January \$30,093, or, at \$4.90 to £ sterling, £6142."

**DURBAN-ROODEPOORT.**—The following results for January have been received by cable:—"Quartz milled, 7210 tons; stamps, 80; days, 19; ounces, 8220; tailings treated, 2010 tons; days, 19; ounces, 692; total ounces, 3812. The cable in announcing the above results also states that native labour is scarce, especially in connection with surface works."

**EAST WEALTH OF NATIONS.**—Under date February 11, the company's manager, Captain Thomas, cables:—"Lease 1041. The north shaft is sunk 53 feet, vertical depth. Have struck lode in bottom of shaft. Have resumed sinking the shaft on lease 1042."

**FERREIRA.**—Copy of cablegram received from Johannesburg, February 8:—"Results for January: Tons crushed, 9610; bar gold extracted, 7028 ounces; concentrates caught, 900 tons; assay value of concentrates, 4 ounces 10 dwts. fine gold per ton.—Cyanide works: Bullion produced from tailings, 1501 ounces." N.B.—December return included 1306 ounces yielded from steaming of plates.

**GELDENHUIS DEEP.**—The following cable has been received from Mr. H. C. Perkins, manager of the Geldenhuis Deep Mine:—"Geldenhuis Deep mill returns show 20½ days; crushed 5545 tons of 2000 lbs. each from mine; 2922 tons from development, yielding 2025 ounces; cyanide treated, 6335 tons, yielding 1367 ounces; total value, £11,400."

**GELDENHUIS ESTATE.**—Results for January: A cablegram has been received from the head office, Johannesburg, stating the following results for last month:—"Crushed, 7257 tons; obtained from mill, 1345 ounces of gold; from tailings by cyanide, 1085 ounces of gold; total, 2430 ounces of gold. The mill ran 13 days.—The following cablegram has been received from the head office, Johannesburg, dated February 12: "The loss in working last month (January), £3700, has been caused by a great scarcity of native labour. Expenses for the month are charged against 13 days run."

**GELDENHUIS MAIN REEF.**—Result of January crushing: 3186 tons crushed, yielding 1309 ounces of gold; 1730 tons treated by cyanide, 438 ounces of gold; total, 1747 ounces of gold. Profit for month, £2050.

**GEORGE GOCH AMALGAMATED.**—The following cable is to hand:—"4485 tons crushed, yielding 1308 ounces, and from tailings 970 ounces."

**GINSBERG.**—Production for January, 813 ounces; 10 stamps, 25 days.

**GLENCAIRN MAIN REEF.**—Production for January, 3163 ounces; profit, £2167; 100 stamps, 17 days. The expenses

this month have been very heavy, for the reason that they have lost time through unforeseen circumstances which have arisen.

**GRASKOP.**—Ore treated: December, 1895, 613 tons, yielding 144 ounces. January, 1896, 378 tons, yielding 129 ounces.

**GREAT EASTERN COLLIERIES.**—Output of coal for January, 11,400 tons. Profit, £1300.

**HANNAN'S REWARD.**—Cable received February 12:—"16 feet at the bottom of the main shaft contain 18 per cent. pyrites, 7 ounces 10 dwts. per ton." The secretary adds, the board thinks the manager means that the 16 feet of veins of gold-bearing quartz, containing pieces of quartz very rich in free gold, as mentioned in his cable of February 7, contains also 18 per cent. of pyrites, which assay 7 ounces 10 dwts. of gold per ton. Further cable received:—"The crosscut to be extended on vein 200 feet level. Reef has an average assay of 4 ounces per ton."

**HANNAN'S SIR JOHN FORREST.**—A cablegram has been received from Mr. Woolcock, the newly appointed manager:—"Main shaft (Brownhill lode) has reached a depth of 90 feet. Opening out to prove lode. Crosscut west has been driven 15 feet. Extended lease (Iron King lode) lode cut in shaft at 60 feet: have opened out and crosscut west 14 feet without reaching wall. The lode looks very promising."

**HARQUAHALA.**—Cabled result of tailings treated at Harquahala for the month of January:—"4210 tons of tailings treated; bullion yielded, \$15,530; expenses on revenue account, \$6400; profit for month, \$9130; at \$4.90 to £ sterling, £1863."

**HAURAKI.**—The directors have received the following information from the manager—viz.:—"Are cutting chamber 220. Cut No. 2 reef and drained 160. Are now sinking below 160 north. On No. 2 reef, reef improves as it goes down."

**HENRY NOURSE.**—Crushing for January: 17 days, 3754 tons produced 2986 ounces; 2930 tons cyanide produced 630 ounces; total 3616 ounces.

**IMPERIAL WESTERN AUSTRALIAN CORPORATION.**—Cablegram just received from Roebourne reports that at the Western Shaw property water has been struck in Battery Well at a depth of 44 feet.

**ISLE OF MAN.**—The secretary has sold 100 tons of this company's ore at £8 10s. per ton.

**JOHANNESBURG WATERWORKS ESTATE AND EXPLORATION.**—The following cablegram has been received:—"Water poll will result in a complete victory for company. Wonderfontein withdrawn."

**JUBILEE.**—Last month's crushing yielded—tons 5630; battery 1808 ounces; cyanide 430 ounces.

**JUMPERS GOLD.**—Results for January: A cablegram has been received from the head office at Johannesburg, stating the following results for last month:—"Crushed 5291 tons; obtained from mill, 2266 ounces of gold; from concentrates (equal to) 410 ounces of gold; from tailings by cyanide, 428 ounces of gold; total, 3104 ounces of gold; profit, £2000. The mill ran 15 days."

**KATHLEEN.**—The directors have received the following telegram from the manager:—"Shaft has reached a depth of 57 feet."

**KAPANGA.**—The directors have received the following information from the manager—viz.:—"Shaft sunk 4 feet for week. Are getting rich ore in small quantities, 420.—Corby shaft. New machinery working well. Are clearing out old workings."

**KOFFYFONTEIN.**—The directors inform us that their returns for the month of January are 3800 carats.

**LANGLAAGTE ESTATE AND GOLD.**—Production for January. By cable:—"Mill. Ore crushed, 19,314 tons of 2000 lbs.; gold returned, 6258 ounces.—Tailings, cyanide process. Tons treated, 12,320 of 2000 lbs.; gold recovered, 1723 ounces.—Concentrates, cyanide process. Tons treated, 400 of 2000 lbs.; gold recovered, 1077 ounces; total gold recovered, 9058 ounces."

**LINDSAYS.**—The following cable has come to hand from the general manager at Coolgardie:—"On January 10 I estimate the amount of ore in sight at 2000 tons above the 100 feet level. I estimate the value of ore 2 ounces per ton. The future prospects of the mine are good."

**LINDSAYS.**—The following has come to hand from the manager:—"There is still good gold in the rise. I am making good progress with the machinery. Since last report I have connected the rise with the Intermediate level. There is still nice gold in the face of the rise; it is now 36 feet from No. 1 level.—No. 4 shaft. There is row 3 feet of pyrites and quartz. The sinking is much better."

**LINDSAYS EXTENDED (EAST).**—The directors have received the following from the mine manager:—"Coolgardie, December 30, 1895. I have caught up the water in No. 2 underlay shaft, and am pushing sinking as far as possible, as I expect the reef will prove much better as the water is coming from the reef."—"January 7. Since my last report, No. 2 underlay shaft has been sunk 2 feet, making 166 feet. The reef is now 1 foot thick, showing nice gold."

**LONE HAND (25 mile).**—The following cable has been received from the mine manager:—"True Blue south shaft. The winze is now down 20 feet. Winze sunk entirely in ore. The ore in the winze is improving as we go down, the average of the samples from this winze is 4 ounces.—Have commenced sinking the incline shaft. A new reef east part of the mine, the assay value of the ore is 5 ounces.—Sunbeam main shaft at 130 feet. Have started to crosscut, anticipate cutting lode within next 30 feet.—Lone Hand main shaft. Now retimbering shaft. As soon as completed we shall commence to drive on high grade ore body 60 feet level."

**MAORI GOLD.**—Copy of cable received from Mr. C. J. McMahon, the managing director in Australia:—"Maori (Menzies). Forwarding machinery from Southern Cross to mine. Driving towards south continues in high grade ore."

**MAY CONSOLIDATED.**—The following cable message, dated Johannesburg, February 7, has been received at the London office:—"The yield of gold during the past month was 3168 ounces from 10,250 tons crushed; mill running 23 days; cyanide, 1880 ounces from 8000 tons; total for month, 5048 ounces."

**MEYER AND CHARLTON.**—Result of working for January, 6058 tons; gold won, 1728 ounces; extracted from tailings, 709 ounces; total, 2437 ounces. Profit for month, £646. Operations were suspended during the crisis, but are in full working order now.

**MILL'S DAY DAWN UNITED.**—The following cablegram has been received from the head office:—"Underlie shaft. The reef is 18 inches thick." This refers to a cablegram published on the 13th inst., stating that there were indications of an improvement in the underlie shaft.

**MILL'S DAY DAWN UNITED.**—The two following cablegrams have been received from the head office in Charters Towers:—(1) "Have crushed during six weeks 1238 tons of quartz for a yield of 1186 ounces of gold. The approximate value of this return is £4050."—(2) "There are indications of improvement in the underlie shaft."

**MOSMAN.**—Bullion ex s.s. *Duke of Devonshire* sold for £2390 18s. 1d.

**MOUNT MORGAN (Queensland).**—Results for the month of January:—Tons chlorinated, 7759; gold returned, 13,513 ounces.

**MURCHISON NEW CHUM.**—The following cable was

received on Monday from the mine:—"Returns for month of January amount to 1015 ounces from 290 tons."

**MYSORE-WYNAAD CONSOLIDATED AND MYSORE WEST.**—The directors have sold the gold obtained in December for £2071 8s. 6d.

**NEW CLEWER.**—Results for January.—From mill: Crushed 1791 tons, yielding 1001 ounces of gold.—From cyanide works: Treated 802 tons, yielding 572 ounces of gold; total yield, 1573 ounces of gold. Total value of month's output, £4833.

**NEW CRESUS.**—Production for January (60 stamps, 17 days), 2020 ounces. Short run owing to recent disturbance.

**NEW GUADALCAZAR QUICKSILVER.**—A cable received from the mines on Thursday morning, states that the production of quicksilver for the month of January last amounts to 15,225 lbs. = 203 flasks.

**NEW HERIOT.**—Last month's crushing yielded 3825 ounces.

**NEW PRIMROSE.**—The London agents announce receipt of the following cable:—"Production for January, 9026 ounces; profit, £5730; 160 stamps, 22 days. The expenses this month have been very heavy, for the reason that have lost time through unforeseen circumstances which have arisen."

**NEW RIETfontein.**—The London agents announce receipt of the following cable:—"Middle reef recovered, 7th level, two shafts. Have struck a strong, well-defined vein, assaying 6 ounces 10 dwts. per ton; this has proved permanency and value at lowest workings."

**ORITA.**—The following cablegram has been received from the superintendent relating to run No. 88:—"We have cleaned up £150."

**PAHANG CORPORATION.**—Returns for January:—Jeram Lumpung mill: In 24 days of 24 hours each 1050 tons of stone were crushed, producing 43 tons 12 dwts. of black tin; 20 head of stamps running; working costs, \$10,750.—Jeram Batang mill: In 27 days of 24 hours each 1060 tons of stone were crushed, producing 43 tons 13 dwts. of black tin; 20 head of stamps running; working costs, \$7500.

**PORGES RANDFONTEIN.**—Production for January. By cable:—"Mill. Ore crushed, 3759 tons of 2000 lbs.; gold returned, 1644 ounces.—Concentrates, cyanide process. Tons treated, 50 of 2000 lbs.; gold recovered, 148 ounces; total gold recovered, 1792 ounces."

**PRECE'S POINT PROPRIETARY.**—The directors have received the following telegram from the manager—viz.:—"Shaft has reached a depth of 62 feet, we are at water level."

**PRINCESS ESTATE.**—Result of working for January: Crushed 2791 tons; gold won 1132 ounces; extracted from tailings 391 ounces; total, 1523 ounces.

**ROBINSON.**—Production for January. By cable:—"Mill. 120 stamps at work; 10,715 tons of ore crushed; yielded in smelted gold, 6875 ounces; from concentrates (by chlorination), 800 ounces; from tailings (cyanide process), 2031 ounces; from own ore, 9076 ounces; from concentrates bought (by chlorination), 1548 ounces; from slimes, 1027 ounces; total gold recovered, 12,281 ounces; profit for the month, £19,000."

**ROODEPOORT UNITED MAIN REEF.**—Crushing for January, 6285 tons, produced 2721 ounces; cyanide produced, 616 ounces; total, 3337 ounces. Profit, £4000.

**SALISBURY.**—Last month's crushing yielded 2100 ounces.

**SHEBA.**—The following cablegram has been received from the general manager, announcing the yield of gold for the month of January:—"3130 tons (2000 lbs.) of quartz, 7010 ounces; old mill, 380 ounces; 3450 tons (2000 lbs.) of tailings, 2140 ounces; 65 tons (2000 lbs.) of concentrates, 480 ounces; total, 10,010 ounces."—A cablegram has also been received stating that five additional stamps have started to work, making 55 stamps in all. The general manager also states that the stopes continue to look well.

**SIMMER AND JACK.**—Crushed 10,400 tons; obtained 4196 ounces of gold from mill, 621 ounces by chlorination, and 1592 ounces from tailings by cyanide during the month.

**SPITZKOP FARM.**—Produce of 10 stamp mill for January, 211 ounces from 678 tons. The manager advises he has not been able to work the mill full time.

**TRANSVAAL GOLD EXPLORATION AND LAND.**—The London office has received the following cablegram:—"Ore mined, 2600 tons; ore treated, 2325 tons, yielding 1625 ounces; tailings treated, 1825 tons, yielding 850 ounces; total, 2475 ounces. Expenses, £4040. Estimated value of bullion, £6950."

**WAIHL.**—Bullion return for 36 days ending February 8, £11,141 from 3090 tons, from tailings £2405 from 2240 tons. Total returns £13,546. Dry weather still continues, water supply greatly decreased, 73 stamps.

**WAIHI GRAND JUNCTION.**—The manager cables February 14:—"Grand Junction engine shaft is down 225 feet. Waihi west prospecting shaft crosscut is driven 50 feet."

**WEMMER.**—The result of work done during January is as follows:—"5148 tons crushed, yielding 3503 ounces gold; 23 days and from cyanide plant, 6625 tons treated, yielding 1308 ounces; 110 tons concentrates caught, assaying 100 dwts. (5 ounces)."

**WENTWORTH.**—The following cablegram has been received from the mines:—"Four weeks' return totals 703 ounces of gold (approximate value, £2580)—namely, 750 tons of ore have been crushed, yielding 670 ounces, and 5 tons crude ore have been shipped, containing 96 ounces. We expect a material increase next month."

**WEST AUSTRALIAN TRADING AND EXPLORATION.**—The following cablegram has been received from the manager of the Sovereigns Mines, Yalgoo:—"Sovereign Prospectors Claim. Lode maintains its width and value carrying good gold. North Sovereign and South Sovereign lode is looking promising, conditions and prospects of the workings most encouraging."

**WORCESTER.**—Result of last month's crushings yielded 2050 ounces of gold.

**WOLHUTER.**—Crushing for January: 5919 tons produced 2174 ounces; cyanide 1042 ounces.

It is notified that Mr. H. F. G. Weber has joined the board of the INTERNATIONAL TRUST AND FINANCE CORPORATION (LIMITED), whose offices are situated in Finsbury House, Blomfield-street, E.C.

## DIARY.

Monday, February 17.

Wondalli Deesoon Gold Mines, Winchester House, 1.

Tuesday, February 18.

Sulphide Corporation (Limited), Cannon-street Hotel, 3/0.

Wednesday, February 19.

Harmony Gold and Land, Winchester House, 2.

Thursday, February 20.

Menzies United Mines, Winchester House, 12.

Waitekauri Extended, Limited, Winchester House 1.

United Gold Fields, Exploration Co., Cannon-st. Hotel, 12.

Waihi Silverton Mines, Cannon-street Hotel, 12.

Friday, February 21.

Heidelberg Estates and Exploration, Win. House, 12/30.

Central Exploration and Investment, Win. House, 12/30.



## REVIEW.

*The Law Relating to Factories and Workshops* (including Laundries and Docks). Part I.—A practical Guide to the Law and its Administration. By May E. Abraham (one of Her Majesty's Inspectors of Factories); Part II.—The Acts with Notes. By Arthur Llewellyn Davies, of the Inner Temple, Barrister-at-Law. With an Appendix, containing a Full List of Special Rules made for Dangerous Employments, and a complete Index to both Parts.

Though the Editors of this work do not claim for it "official authority," yet it would be difficult to imagine a treatise on this somewhat involved, and to many minds mysterious, branch of the law, better conceived, or carried to completion. The changes introduced by the Act, which came into force at the commencement of the present year, rendered a practical treatise necessary. Miss Abraham and Mr. Davies have been happy in their joint production. Miss Abraham, before she was selected by the Government as the pioneer lady Inspector of Factories, was well known for her able advocacy, both in the Press and on the platform, of consideration for the health and happiness of her poorer working sisters. When she came to her present work her large knowledge of women and their occupations rendered the somewhat difficult duties of her new position a source of pleasure rather than an irksome task. This is shown by the thoroughness and perspicuity she exhibits in her introductory chapters. She has been well advised in leaving the law technicalities to Mr. Davies, who has carefully noted recent decisions up to date. The earlier chapters are, to our surprise, really interesting reading, not only to employers and employed, but to all interested in the welfare of the working population. After dealing with a general view of the Factory and Workshop Acts, the Shop Hours, and the Truck Act, and all other sections in similar statutes, with the orders made by the Secretary of State, there is added a very useful appendix, containing a full list of special rules made for dangerous employments. A careful cross-reference index, which can be mastered easily by either a legal or lay mind, completes this very satisfactory handbook. The treatise, chapter by chapter, deals with sanitary provisions, safety, employment certificates, education, holidays, accidents, laundries, docks, building bakehouses, tenement houses, outworkers, work and wages, administration, and legal proceedings. The authors have, in our judgment, very judiciously inserted the full text of the various Acts quoted, and have not attempted to "bowdlerise," a course which is not infrequently adopted by some writers on legal subjects, much to the disadvantage of accuracy. The Factory Acts should be now intelligible to all, and the writers of magisterial guides, who have omitted them from their works on the ground that they are too technical, can only be handled with the assistance of one of Her Majesty's Inspectors, may now approach the task with some chance of success. Miss Abraham's book is well printed on good paper, and the nearly 300 pages are wonderfully cheap at the price fixed by the publishers.

## HAS ALUMINIUM A GREATER FUTURE?

## A REASONABLE OPINION ABOUT THIS METAL.

THE question of the cheap production of aluminium has been solved a long time ago. There is much inducement in the task of making serviceable for various purposes a metal which can be had cheap in an absolutely pure condition, especially as it is remarkable for its lightness, beauty of colour, and its capacity for being polished, hammered, and drawn out. Thus we see utensils made for eating and drinking purposes, vessels for laboratories, surgical and optical instruments, and art uses it for diverse objects. It has been made serviceable in electricity, as it is a much better conductor than iron, and, by alloying, it is hoped aluminium, bronze, and also copper alloy will replace with advantage steel in fire arms. Owing to its light weight this metal has likewise made its way into all branches of industry. Even horseshoes are already made of this metal, and as this kind of shoeing takes the form of the hoof it is more comfortable. It cannot be doubted that aluminium is preferred to every other material for a great many objects, but such vast use and employment of aluminium in the future as may hold out a prospect of an aluminium age is hardly to be expected. Many experiments have proved the small power of resistance of aluminium, so that its use seems to be excluded from whole groups of objects. It must also be rejected for things that come in contact with boiling water. This fact, therefore, prohibits its use for aluminium cans for the packing of preserved provisions, as the cans would suffer during the sterilisation by boiling, and, therefore, the aluminium would affect the provisions. Even if sterilisation takes place before filling, or not at all, there is always the danger that the ingredients of the preparation may dissolve the aluminium. That this is really the case, and prevails in a great degree, especially where inorganic acids are present has been proved in many cases. An extensive use of aluminium has been planned in the equipment of troops, and the use of aluminium for the metal parts of the uniform and equipment, would mean an inestimable lightening of the burdens the soldier has to carry. Soldiers' flasks made of aluminium are very remarkable for their lightness and their unbreakableness. The desirability of their introduction into the Army, however, might be questioned by the fact that the liquids destined to fill them would dissolve the aluminium. A small quantity of acetic acid, citric acid, and tartaric acid, has a considerable action upon it, and infusions of tea and coffee absorb a great quantity of the metal. Tannic acid is also a great solvent. Although provisions may not be affected in their taste by aluminium, yet a constant contact with the metal, even in small quantities, ought to be avoided. Further, aluminium cannot be used for objects which are cleaned or come into contact with soda and soap, as these bodies are by no means indifferent to this metal. In shipbuilding, likewise, the use of aluminium will not obtain that high importance at first supposed. Men-of-war will not be able to use much aluminium, as it scarcely offers a sufficient galvanic resistance. Aluminium does not seem to be destined to play a great part in surgery. The most common antiseptic must not come into contact with aluminium instruments, as already carbolic acid, salicylic acid and boric acid affect the aluminium. Far from wishing to disparage this metal it must yet be acknowledged from the above statements that the importance at first expected from aluminium in commerce has not been realised.—Karl Barth in the *Montan Zeitung*.

ALGERIAN PHOSPHATE DEPOSITS.—Fresh searches were made at Algiers on Tuesday, at the residences of M. Gerome Besignat, ex-Mayor of Bona, and his brother, in connection with the affair of the phosphate concessions. The two brothers were afterwards interrogated by the examining magistrate.

## CORRESPONDENCE.

We wish it to be understood that we do not hold ourselves responsible for, and do not necessarily endorse, the opinions of correspondents. All communications must be accompanied by the names and addresses of the senders, though these need not necessarily be published.

## WELSH GOLD MINING.

TO THE EDITOR OF "THE MINING JOURNAL."

SIR,—In the issue of *The Mining Journal* of November 30, 1895, appears a letter under the above heading, which, whilst advocating with just cause the claims of Merionethshire to be considered a gold field, goes into the question of ore reduction, and particularly as regards stamps and rolls. This coupling of technical details with the general question of Welsh gold mining is apt to be misleading, giving the general public the idea that Welsh gold ores require special and peculiar treatment as compared with others. This idea, as a matter of fact, is already current, and is a fallacy. The problem of the treatment of such ores is not new, and has long been solved.

Without entering into a general disquisition on stamps & rolls, or even their respective number of wearing parts, it may suffice to keep to the main question—which is, according to your correspondent, that the excessive cost of reduction by stamps makes their use prohibitive, and a cheaper method must be found ere the low-grade ores of Wales can be profitably worked. The answer to this is emphatically given in the same issue of *The Mining Journal* by reference to the report of the Alaska Treadwell Company—showing that ore yielding only \$3.68 per ton in bullion is mined and treated at a total cost of (say) \$1 per ton. Milling and concentrating is returned at \$0.29, treatment of concentrates \$0.11, or \$0.40 per ton for reduction and extraction (say, 1s. 8d. per ton).

Milling charges at the Morgan Mine, Dolgelly, under the late company dropped below 1s. per ton, which includes delivery of the gold into bars as bullion. The present company return their milling cost for the first 15 months at 2s. 3d., varying over that period from 1s. 4d. up to 4s. 5d.

Whilst disclaiming any intention of wishing to depreciate improvement in the direction of cheapening reduction, it must still be evident that such figures do not leave much margin. Any reef not holding out prospects of being able to bear such charges should be left alone wherever situated.

Your correspondent, in his comparisons, omits to mention that stamps, in addition to crushing ore, deliver a product already screened, and frequently, even in Wales, act as gold extractors. Apart from questions of detail, however, it is a fact that the Merionethshire are mainly stamping and not roller ores. Incidentally the lead ores of Flintshire are preferably treated by rolls and not by stamps. Both methods of reduction have their own special advantages and particular merits, under given circumstances, and are to be applied accordingly. When considering any particular case, the primary consideration is the efficiency likely to be attained by the plant as a whole, rather than cheapness of first cost or erection of any particular unit.

The gold ores of Wales that have been worked show an extraction over a considerable tonnage of, roughly,  $\frac{1}{2}$  ounce per ton, being about the world's general average. The history of the Morgan Mine, above mentioned, is instructive as bearing on gold mining failures in the Principality. The late company obtained an average yield of over  $\frac{1}{2}$  ounce. Capitalised at £210,000—out of which the vendors took £190,000—it came to grief; but certainly not through excessive milling costs. The present company, with an average yield of 12 dwts. and a nominal share capital, pays, using the same plant.

Two causes, additional to those mentioned by your correspondent, have militated against success in Wales in many instances where failure has resulted. Perhaps, owing to its proximity, it has been the happy hunting ground of (a) the amateur expert; (b) the new process fiend. Between them they have succeeded in creating a wide-spread and false impression that the ores of Wales are not amenable to standard methods of treatment.

On one occasion, when in charge of gold mining operations in that district, I was asked to buy a dry-blowing machine that had originally been taken up to treat an ephemeral alluvial deposit on the top of a mountain. Needless to remark, it was offered very cheap, and in Western Australia would have found a sphere of usefulness. The moral is two-fold and obvious.—I am, Sir, yours faithfully,

A. H. BROMLEY.

Nankan, Upper Burma, January 11.

## OTTO ROPEWAYS SYSTEM.

TO THE EDITOR OF "THE MINING JOURNAL."

DEAR SIR,—In the review of the fifth edition of Mr. Bennett H. Brough's "Treatise on Mine Surveying," which appeared in your last issue, I think the reviewer has somewhat exceeded the bounds of fair anonymous criticism when he incidentally disparages the Otto system of aerial ropeways by using one of those "oblique offsets" he appears so strongly to object to.

He states that "it has, indeed, considerable difficulty in holding its own with some of the better single rope systems."

Though I by no means deny there may be cases where a single ropeway can be used with advantage, still the fact remains that the double rope system has no difficulty in holding its own.

Your reviewer ought to be aware that, though the single rope system was for many years the only one in use in this country and on the Continent, it has almost entirely been superseded by the double rope, or Otto system. There are now over 500 double ropeways in successful operation in different parts of the world. Can your reviewer name 50, I might almost say 5 single ropeways of importance at present at work?

The reference to the Sheba line is misleading, and as this is not the first time that it has been so used by unfriendly critics, I shall be glad if you will permit me to state the real facts of the case.

The difficulties which were successfully surmounted in the construction of this line were enormous, and this fact would, I think, be readily admitted by any competent engineer who took the trouble to investigate the facts. The real reason for the ultimate stoppage of the line was in no way due to the system, but to entirely different causes. The turbine and dam were washed away, as happened in another case in this district, thus depriving the line of its motive power. For various other reasons, entirely unconnected with the line, the company reorganised the relative sites of the battery and motive power in respect to the mine, thereby rendering the use of a ropeway unnecessary. Whilst the ropeway was at work it successfully carried the ore to the battery at a rate unapproachable by any other system. Thanking you for giving me the opportunity of making this explanation,—I remain, dear Sir, yours faithfully,

R. E. COMMANS.

CHAFFERS GOLD MINING COMPANY (LIMITED).—The directors have ordered for immediate shipment a Burton rock drill plant with winding and hauling gear complete, to enable the local management to get through the hard ground encountered in the workings.

## THE METAL MARKETS.

## LONDON METAL MARKET.

THE METAL MARKET, LONDON, FEBRUARY 14.

## Copper.

THIS market underwent a slight reaction in the earlier part of the week, but a vigorous advance followed, and the close was very firm. The heaviest purchases of G.M.B.'s are to be ascribed largely to covering of bear sales, but consumers have also been operating very freely, especially towards the end, and the final values are the best of the week. Manufactured copper continues in quiet demand, as also do yellow metal and India sheets, but all the mills are still very busy. The speculative market opened with a fair business in G.M.B.'s at gradually receding prices, s.c. changing hands at £43 15s. to £43 7s. 6d., and three months at £44 3s. 9d. to £43 17s. 6d., the lowest prices named being accepted on Tuesday, in which the turnover was very large. After fluctuating between £43 12s. 6d. and £43 10s. for a while, a brisk rise set in on Wednesday which carried the spot value to £44 8s. 9d. on Friday. The market closes strong at £44 8s. 9d. s.c., and £44 16s. 3d. three months buyers, with sellers at half-a-crown higher. The American advices continue very firm, and the price of Lake has again advanced.

## Tin.

This market opened quiet at £60 13s. 9d. s.c. and £61 5s. three months. There was no special interest displayed, and the article gradually lost ground £907s. 6d. spot, and £61 three months being done on Tuesday. The value then recovered to £61 sharp cash, and £61 10s. forward, and the close is steady at £60 18s. 9d. s.c., and £61 8s. 9d. three months buyers. The Dutch market, after an intervening relapse to 36½ fl. s.c. Billiton, closed yesterday morning firmer again, at the opening value for s.c.—viz., 36½ fl., with three months 37 fl.—i.e., an advance of  $\frac{1}{2}$  fl.

## Pig Iron.

The Glasgow market opened at 47s. 3d. s.c. Scotch, which touched 47s. 6d. the same day, and thenceforward fluctuated between 47s. 2½d. and 47s. 7d., closing dull at 47s. 4½d. sellers, with hematite and Middlesbrough respectively at 48s. 8½d. and 38s. 4½d.

## Lead.

is a quiet market, but prices continue steady, and sellers evince no eagerness to operate. The close is at £11 5s. to £11 6s. 3d. soft foreign, and £11 8s. 9d. to £11 10s. English.

## Spelter.

has again advanced in value, and there is more consumptive demand apparent, whilst producers everywhere are holding for higher prices. The close is firm at £15 3s. 9d. for ordinaries, and £15 6s. 3d. specials.

## Antimony.

is quiet at £29 10s. to £30.

## Quicksilver.

steady at £7 2s. 6d. firsts and £7 2s. seconds.

The following are to-night's (February 14) prices of metals:—

	Copper.	£ s. d.	£ s. d.
Tough cake and ingot	...	47 0 0	47 10 0
Best selected	...	48 5 0	48 15 0
Electrolytic Copper	...	48 15 0	50 5 6
Sheets and sheathing	...	...	55 0 0
Flat bottoms	...	...	58 0 0
Good merchantable, spot, & 3 months respectively	...	44 8 9	44 16 3
Copper tubes, seamless	...	...	0 0 7½

	Alloys.	£ s. d.	£ s. d.
BRASS: Wire	...	...	0 0 5½
" Tubes (solid drawn)	...	...	0 0 6½
" Sheets	...	...	0 0 5½
PHOSPHOR BRONZE: Alloys II.	...	...	78 0 0
" III. or	...	...	81 0 0
" VII.	...	...	82 0 0
" XI.	...	...	78 0 0
" Vulcan brand Al	...	...	72 0 0
DURO METAL	...	...	72 0 0
BULL'S METAL	...	...	65 0 0

	Ferrobronze (Vivian's).	£ s. d.	£ s. d.
Ingots	...	0 0 5½	...
Ordinary sheets, plates, bolts and bars	...	0 0 6½	...
Screw bolts and nuts	...	0 0 8½	...
Pump rods, plain	...	0 0 7½	...
" finished	...	0 0 10½	...
DELTA METAL: No. 4 (per ton)	...	...	...
" Sheets and plates (per lb.)	...	...	...
" Bars, round, square, flat (per lb.)	...	...	...
" Hexagon (per lb.)	...	...	...

	Tin.	£ s. d.	£ s. d.
English, ingots, f.o.b.	...	...	85 5 8
" bars	...	...	86 5 8
" refined	...	...	87 5 8
Strait, spot and 3 months respectively	...	80 18 9	81 8 9
Australian spot, and three months respectively	...	81 13 9	82 3 9
Banco (in Holland)	...	82 7 8	82 10 0
TIN PLATES: Charcoal, best quality	...	per box	0 14 8
" ordinary	...	...	0 10 8
" Coke, best quality	...	...	0 8 8
" ordinary	...	...	0 8 8

	Iron.	£ s. d.	£ s. d.
Fig. G.M.B., f.o.b., Clyde, spot	...	...	2 7 4
" Scotch pig, No. 1 Gartsherrie	...	...	2 11 0
" " Coltness	...	...	2 13 8
" " Clyde	...	...	2 10 0
" " Govan	...	...	2 8 8
Bars, Welsh, f.o.b., Wales	...	...	5 5 0
" Plates	...	...	6 5 0
Bars, Staffordshire, at works	...	...	5 7 6
Sheets	...	...	7 3 8
Plates	...	...	6 10 0
Hoops	...	...	5 15 0
Ship plates, Middlesbrough	...	...	4 15 8
STREET: English spring	...	...	16 0 0
" cast	...	...	52 0 0
" Rails at works, according to section	...	4 2 8	4 10 0

	Lead.	£ s. d.	£ s. d.
Spanish or soft foreign	...	11 5 0	11 6 8
English pig, common	...	11 8 9	11 9 0
" L.B.	...	...	12 0 0
" sheet and bar lead	...	...	12 7 6
" pipe	...	...	12 17 6
" red	...	...	14 10 0
" white	...	...	17 10 0
" patent shot	...	...	15 2 6

	Spelter.	£ s. d.	£ s. d.
Silesian ordinary brands	...	...	15 3 9
" special brands	...	...	15 6 2
English Swansea	...	...	15 16 3
Sheet Zinc	...	18 10 0	18 12 6

	Antimony.	£ s. d.	£ s. d.
Antimony	...	29 10 0	30 0 0
	Quicksilver.	£ s. d.	£ s. d.
Flasks, 75 lbs. warrants	...	7 2 8	7 2 8
Ore, c.l.f., U.K. ports	...	...	...

	Manganese.	£ s. d.	£ s. d.
1st quality, 50 per cent. and upwards	...	0 9 11	0 11 0
2nd " 47 per cent. to 50 per cent.	...	0 8 10	0 10 0
3rd " 40 " 47 per cent.	...	0 8 9	0 11 0
	Aluminium.	£ s. d.	£ s. d.
98-99½ per cent. (guaranteed 98 per cent. min.) in Per lb.	...	...	...
Ingots (1 cwt. lots)	...	...	0 1 6½
do do (1 ton lots)	...	...	0 1 8
	Nickel.	£ s. d.	£ s. d.
98-99 per cent. guarantee	...	8 12	8 1 8

PROSPECTING IN INDIA.—Mr. Charles E. Simmons, discussing what he calls the "rules for the discouragement of mining in India," says that one of the most absurd features of the new rules for prospecting in India is that the owner of an exploring license is not allowed to turn up the ground beyond the depth of 2 feet. This is what is called "hen scratching" in Australia, and will, he expects, be more honoured in the breach than in the observance.—*Indian Engineer*



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 ARE BUYERS OF  
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**LAMBERT'S WHARFAGE CO.,**  
**PRINCE OF WALES DOCK, SWANSEA.**  
 Ores, Mattes Regular, and Bars received and prepared for market.  
 Copper, Lead, Tin, Spelter, and Pig Iron Received, Weighed, and  
 Sampled, and Warrants issued against same.  
 N.B.—Warrants are on Accepted List of London Metal Exchange.  
 Regular lines of steamers from America, Europe, &c.  
 Good prices can be obtained for low produce Copper Ores. Send  
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### COLORADO MINING AND OTHER INVESTMENTS.

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LONDON: FEBRUARY 15, 1896.

## BOTH SIDES OF THE WESTRALIAN SHIELD.

SO many utterances regarding Coolgardie and other West  
 Australian districts as mining centres are coloured by  
 personal predilection and prejudice that it is a difficult  
 matter to attain a clear insight into the truth, and to form a  
 comprehensive view that shall take in both sides of the shield.  
 Undoubtedly some sort of rough average can be struck between  
 the extremes; and it is by no means necessary to hold with one  
 party that the water difficulty is non-existent, or with the  
 other that the industry is bound to split upon the natural  
 difficulties inherent in the country; but a shorter and  
 more reliable method for getting at the reality lies  
 in a careful consultation of the statements of shrewd  
 judges with practical experience, whose utterances are couched  
 in that calm and temperate tone, which removes from them all  
 imputation of holding a brief for either of the classes into  
 which the Stock Exchange is divided by men whose humorous  
 faculty is paralleled by their fertility of imagination. When  
 so large a space in the public attention is filled by this subject,  
 there is no occasion to be apologetic as to the fulness of the  
 space we are inclined to accede to it, or to cavil at the volume  
 and number of the interviews from experienced mining and  
 financial men—some of them, it must be owned, special pleaders  
 —which are filling to-day's newspaper. In considering the  
 natural facilities for, or obstacles to, mining progress in  
 West Australia, the chief point that at once claims the  
 attention is the great, and by this time well-worn  
 question as to the water supply. No doubt, it would be entirely

erroneous to assume that the scarcity of this vital element in  
 social and economical life is the only difficulty against which  
 West Australia in general, and Coolgardie in particular, has to  
 contend. There is, of course, the necessity for good mining  
 timber, which bids fair at no distant date to denude the whole  
 Coolgardie district of the few trees Nature has been kind enough to  
 plant there, and there are, besides, other difficulties of transport  
 and labour. But water is the burden of both the optimistic  
 company director and of the bear anxious to get in at a low  
 figure, and with this primary consideration the whole success  
 of the colony's chief industry seems closely identified.

Our own view on the question has always been sufficiently well-  
 defined and temperately expressed. Recognising that truth  
 probably lies in the mean, we have given a large place to the  
 water difficulty as one of the chief obstacles minding men at Cool-  
 gardie would have to deal with. Spirited and highly beneficial  
 attempts are undoubtedly being made to get the better of this  
 obstacle to industrial progress by recourse to the dry processes  
 which have been, in some instances tentatively, and in others  
 confidently put forward. But while dry crushing, as was recently  
 stated shortly, but clearly, in these columns, is "now  
 established as a regular metalliferous process," it would be  
 hazardous in the case of so new a country, and so recent a  
 development of method, to say that it altogether  
 solves what prudent and sober judges everywhere admit  
 to be a knotty problem. During the last few days two  
 interviews have appeared in the public Press that well deserve  
 careful attention from those really desirous to get at the fact  
 in this matter. Both the gentlemen who were subjected to the  
 fruitful "drawing" process, known as "interviewing," were alike  
 in realising the grave aspect assumed by some phases of the  
 West Australian mining question, and also in holding that by  
 the genius, energy, and enterprise displayed by those associated  
 with the management of affairs connected with the colony's  
 gold development, the industry would eventually be brought  
 triumphantly through its difficulties, and placed upon a  
 solidly successful basis. In conjunction with their evi-  
 dently prudent turn of mind, the cheerful view taken  
 by these two gentlemen is a fact likely to impress  
 itself firmly enough upon the public mind. If Mr. J. B.  
 SIMMONS' utterances may be taken as fairly representative of  
 the mental attitude assumed by the colonial leaders, there is the  
 strongest reason to argue forward very hopefully to the indus-  
 try's future. His former connection with the Perth Government  
 as Chief Accountant of the Public Works Department would  
 seem to warrant the view that his opinions and line of approach  
 to the general question are in no way singular. Mr. SIMMONS  
 clearly appreciates to the full what the water difficulty really  
 means, and he forcefully indicates the extreme unsuitability to  
 ore treatment of the salt and brackish water tapped in some  
 parts, and the immense difficulties incidental to condensation,  
 owing to the frequency with which the boilers are choked with salt.  
 Having stated thus candidly the darker side, Mr. SIMMONS, un-  
 like the pessimistic growlers who ignore the possibility of redress,  
 and who would seemingly sit down permanently and deplore the  
 scarcity of oases in the West Australian desert, proceeds  
 to point the direction in which, according to his view,  
 the solution of the problem and the salvation of the  
 industry may most probably lie. He finds it in the introduction  
 of electricity. "A big electric scheme," he says—we cannot do  
 better than quote his words—"is already being planned out.  
 The power will be generated at Northam, where there is  
 an ample water supply, and sent on by means of cables to  
 Southern Cross, and so to the mining centres. This power will  
 be all that is necessary for the working of underground rock  
 drills, hauling quartz, pumping salt water, and crushing quartz  
 at mines with batteries where there is sufficient water supply for  
 the purpose. This will do away with boilers, and one portion  
 of the water troubles. Power will simply be 'turned  
 on' at the mine, and every mine will have its meter." For those  
 companies who cannot obtain water—even of the brackish sort—  
 a simple but effective scheme has been devised. The Govern-  
 ment has granted powers to two companies to put upon the  
 railway line trucks built in a peculiar manner, so as to carry ore  
 and water. First, they are tanks to convey water, but above  
 these are rails to carry six small trucks, each holding half a ton  
 of ore, so built that they can be run on abreast from a siding.  
 These wagons are taken to Northam, where they are run off to  
 the batteries. On the return journeys the trucks will carry  
 back water to the famished mines.

Mr. EDMUND MITCHELL, the managing director of Scottish  
 Westralia (Limited), spoke with similar frankness and similar  
 confidence in the ability of the nation who have constructed the  
 Forth Bridge and the Thames Tunnel to overcome natural  
 obstacles of almost every sort. There was no attempt on his  
 part to gloss matters over. At Hannan's, he had to admit, the  
 water scarcity reached the extreme point of forcing the toppers  
 to take their intoxicants undiluted, while thirsty men were  
 being driven in from the surrounding districts. Here, as  
 ever, the solace comes afterwards. The Government, under the  
 enlightened leadership of Sir JOHN FORREST, are boring  
 with great activity, and the pitiable state of things just  
 chronicled is not likely to recur. Cases of extreme water  
 scarcity are so frequently subjected to quotation that  
 people are apt to forget that some companies are  
 so favourably situated in this particular regard that  
 the supply obtainable from their properties not only  
 suffices for their own needs, but enables them to extend con-  
 siderable aid to their less fortunate brethren. Thus a cable has  
 come to hand notifying the highly-palatable fact that a flow of  
 fresh water has been struck on the Menzies Gold Estates,  
 welling up at the rate of 3200 gallons a day. To suppose that  
 this particular company is the recipient of an altogether  
 exceptional slice of good fortune would be utter fatuity. Where  
 one property has yielded so richly, there is always the chance—and  
 the not inconsiderable chance—that others may show equally  
 creditable results when tested in the same manner. Facts such  
 as these, conjoined with the tried and known enterprise of the Eng-



lish mining engineer when confronted with natural obstacles, give one the greatest justification for hoping that the near future may bring a pithy and satisfactory answer to the water question. Government are bestirring themselves in the matter, wells are being opened up, railway communication for, among other things, the passing of water tanks, is extending apace, and with these considerations before him, and the knowledge that the dry processes are making satisfactory headway, he must indeed be a sombre-minded croaker who would refuse himself the pleasure of hoping that the gold mining industry will soon be free to expand itself unhindered within the utmost limits of its productive capacity. Thus for the water question, and a similar line of treatment would apply to the question of mining timber. West Australia is not absolutely without trees, and with a proper measure of restriction in force, so that the resources may be turned to the best possible account, and the supplementary possibilities of conveyance over the railway, the timber difficulty may be expected to fall "into the common grave of visions past." We are far from counselling an attitude of unreasoned optimism on these questions, but we are similarly loath to see anybody pay undue attention to the voices of those who cry themselves hoarse in the wilderness, and our final word would be a recommendation to all to look at both sides of the shield.

## RHODES AND RHODESIA.

MR. RHODES, without giving any warning, has returned to South Africa, just when we were all looking forward with eager expectancy to his coming speech before the Chartered shareholders. But he has disappointed us; our eagerness has been rudely quelled; and our expectancy has been changed to open-mouthed astonishment. After all, however, we might have anticipated it. We have been sufficiently acquainted with Mr. RHODES now to know that he is a man of rare genius; that his character is as profound as his schemes are colossal; and that his conduct, naturally swayed as it is by these uncommon qualities, partakes of the incomprehensible. We thought he was coming over to ease our minds and relieve our anxiety. But this duty to the public is not considered by Mr. RHODES to be compatible with his own interests and those of the Chartered Company, and, therefore, he has chosen to ignore it. However, it is of little use to be greatly indignant with him. It would be a futile expenditure of energy, because Mr. RHODES would be absolutely uninfluenced and unfettered by our sentiments. We must wait patiently, and see how events will turn out. It may be all for the best. In fact, it is likely to be, but we should have been a little more pleased with this gentleman had he shaken hands with us, and taken us a little more into his confidence. It is not pleasant to be treated with such disdain. To call it by no other name, it is distinctly an act of discourtesy. Besides, we should have thought Mr. RHODES would have been more considerate towards himself. He knows full well the suspicion with which he is regarded, and instead of trying to remove it, he has done the very thing to intensify it. When, however, he chooses to enlighten us, he may show us conclusively that we have misjudged his motives, and that the latter have all along been characterised by the purest honesty and uprightness. It all comes of his profundity of character. Our weakness of vision cannot pierce to the depth of it, and hence our mystification. Unfortunately, Mr. RHODES has no sympathy with our weaknesses. Like Teufelsdröckh, he is above them. He sits calm and serene in his consciousness of profundity, and contemplates, with no anxiety, our feverish struggles for a hearing. He has gone to Rhodesia, we are informed, with the object of pushing on the railway and the development of the country. A laudable object, but a week's or even a fortnight's delay would not have retarded progress to any grievous extent. Probably he thinks that success in this direction will restore him to the favour he has to some extent lost, and will effectually crush any feeling of resentment to which his recent conduct has given rise. There is every likelihood of this. Crushing our indignation, therefore, let us consider the consequences of his mission to Rhodesia, and of the prospects of that country. In the first place, greater interest will be taken in its mineral resources. There is, undoubtedly, a promising future before the country, but, as yet, it has not progressed beyond the promising stage. There is little question amongst experts as to its highly mineralised character, but, so far, the results of working fall far short of the conditions which would justify a heavy influx of capital. As a writer in *The Times* pertinently puts it:—"Although the mining districts have been open, and perfect security for life and property has been assured, since the termination of the Matabele war, no great results have been achieved. This fact contrasts unfavourably with the rapid development of the Rand between the first discovery of gold in 1886 and the boom year of 1889. On the other hand, it must be taken into consideration that, bad as were the conditions of transport in the Transvaal, the introduction of heavy mining machinery into the heart of Rhodesia is still more difficult. The cost of transport per ton from the seaboard to the principal mining centres is still almost prohibitive of experimental mining ventures, and the people of Rhodesia are not dealing with an administration which is opposed to the introduction of railways, and forces them in consequence to work under immediate conditions in despair of amelioration. They have at once the advantage and disadvantage of believing that railways will soon be introduced, and it is, therefore, their interest at present to extend the range of initial development and to postpone actual working until machinery can be brought in at less cost. Hence, so far, it is believed, there have been no very definite results, but possibly a wide foundation has been laid for future work." In the first place, it is absolutely necessary to develop the means of transport, and Mr. RHODES has gone out with this primary object in view. The railways, therefore, will be pushed forward with all expedition, and when the excessive cost

of transport has thereby been materially lessened, then may we look forward with more hope to a more profitable exploitation of the mining industry. When all these difficulties and obstacles are removed, then will Rhodesia occupy an extremely favourable position. Miners and settlers there will live under the protection of the British flag, an advantage which has lately been more greatly emphasised and more generally recognised.

During the week we have had the advantage of a personal conversation with Mr. C. J. ALFORD, a mining expert of world-wide reputation, and a member of the eminent firm of Messrs. BEWICK, MOREING, and Co. This gentleman has just returned from a lengthy sojourn in Rhodesia, and, therefore, the opinions he has formed of the country are of great value. To give his views in brief, he holds a very high opinion of the possibilities of the country. But he wisely points out that it will take time to properly develop its resources. Admitting that nothing exceptionally rich has been discovered, it is no proof that the country is poor. He is acquainted with many properties which could be worked to a profit with due economy. But those economical conditions have yet to be provided, and the most essential is railway extension, and the lessening thereby of the cost of transport. Upon this factor he rightly places the greatest emphasis. As to the permanence of the reefs, he wisely expresses no definite opinion. No expert would thus give himself away without obtaining further and more reliable evidence. At the same time he points to the fact that there are great quantities of gold-bearing rock near the surface, yielding free gold, which could be easily worked and milled, and his strong advice to owners of mines is to group their properties, in order to get a large amount of surface rock, and then put up some small mills to work it. By the time they do this the railways will be built, and thus they will be in a better position to take advantage of the transport facilities. At any rate, even if the gold did not hold out in depth, they would not lose anything by this grouping. These are Mr. ALFORD's opinions and advice in brief, and they are worthy of grave consideration. Having for the present fulfilled his mission in Rhodesia, Mr. ALFORD goes to Australia and New Zealand, and thence to that other promising country, British Columbia. When he returns he will no doubt favour us with his opinions on each of these colonies, and these we will duly communicate to our readers, who, in the meantime, will be pleased to join with us in wishing him a *bon voyage*.

## THE FATE OF THE CHARTERED COMPANY.

WE can with some certainty anticipate, from the significant utterances of Mr. CHAMBERLAIN, in his speech on the Transvaal question on Thursday, what will be the probable fate of the Chartered Company. Of course, there has been a great and widespread demand for a revocation of the Charter, and this demand has emanated in a considerable part from the Radical Press and the Radical community. This was even demanded before we knew what we now know of the crisis in the Transvaal and of the circumstances attending Dr. JAMESON's raid. It must be admitted that there was some justification for the feelings which expressed themselves in this outburst, for the Chartered Company lay under grave suspicion. Not only was Dr. JAMESON a servant of the company, but the forces which he employed were also in the company's employ. Then, again, he was known to be the right-hand man of Mr. CECIL RHODES, and the latter, being the guiding spirit of the company, ought to have known, it was contended, of the projected movement of his subordinate. Although there is yet to be an investigation into the action of the company, we can foresee with some certainty what the outcome will be. As we have already said, there is no probability that the Charter will be revoked, but we may be quite assured that the powers of the company will be considerably modified. Mr. CHAMBERLAIN, who has information at his command of which the public are as yet ignorant, is confirmed in his own mind that the officials of the company are entirely blameless. Of course, this is yet to be judicially proved, but it is unlikely that further evidence will be forthcoming to implicate them more seriously. Even then there would be a likelihood of the Charter being retained, for if the officials of the company are culpable, there are the vast body of shareholders to be considered, who are certainly innocent. As Mr. CHAMBERLAIN said—"There are 30,000 of them, and for their sake, at all events until the case is heard, the Charter of the company cannot be properly taken away." But there is even a more serious question to be asked and to be answered, and that is whether the administration of the company's territory shall continue in the same form and in the same hands. This is serious, because if they were taken from the company's control they would have to be administered by the Government, and Mr. CHAMBERLAIN demonstrated that this would involve difficulties almost insurmountable, and would not be likely to result in a successful or a speedy development of those untried countries. At any rate, the recent proceedings have demonstrated beyond the shadow of a doubt that the Chartered Company has been either unwilling or unable to control its officers, and to prevent them from acting in a manner menacing to the peace of the world. This state of things, at any rate, cannot continue; therefore, the directors have been informed that their military and police forces will be taken from their control and placed under officers appointed by the Government, and that in future the orders of the latter will be taken from the High Commissioner. Thus, in the meantime the company has been deprived of the possibility of doing any harm either to the Transvaal or to British interests, and for the present, therefore, we may rest content. There is little doubt, of course, that the directors of the Chartered Company are little pleased at the action of Mr. CHAMBERLAIN, but

they must grin and bear it, and admit that it is in perfect accordance with justice.

Mr. CHAMBERLAIN is also convinced in his own mind that Mr. CECIL RHODES is innocent of the charges which have been made against him. This announcement will go a long way to remove the suspicion and distrust with which the late Premier of Cape Colony has been regarded. In another leading article we deal with Mr. RHODES' visit to this country, and his departure from it without taking the public into his confidence. We have expressed our surprise at his conduct, but we have no wish to imply that we discount the great good he has done throughout his great and distinguished career. We owe to Mr. CECIL RHODES a debt of gratitude, and it is not likely that we shall ever be in a position to repay him. In judging him we must not forget that, though he is a man of exceptional ability, he is liable to err. However he may be judged, we must admit that he has been greatly punished. His power—at any rate, his political power—has been broken. He returns to South Africa a private individual, in order to develop the resources of the country which bears his name. Whatever mistakes he may have made in the past, whatever weaknesses he may have manifested, we must all admit that he has been a great power for good, and we agree with Mr. CHAMBERLAIN that it would be an act of ingratitude to forget the great services he has rendered. We believe that he is capable of great services still, and that not only is he capable, but that he will perform them, and that we have not seen the last of the great advantages which will result from the work which it is his ambition to accomplish.

## TRANSVAAL AFFAIRS.

THE announcement with which Mr. CHAMBERLAIN concluded his great speech in the House of Commons on Thursday reveals a grave aspect of the situation. Unfortunately, it is the outcome of a mistake—a first and admitted mistake—on the part of the Colonial Secretary, and it has given serious offence to the Transvaal Government. It is an error in diplomacy, and, unfortunately, it is regarded in the worst light by President KRUGER, who gravely says:—"The efforts thus far employed by the Government to obtain the ultimate establishment of a good understanding between the Republic and England in a moderate and peaceful manner will, in its opinion, be involved in great difficulty, to the great danger of the peace and order, not only of the Republic, but of the whole of South Africa, by again exciting and disturbing the minds of the inhabitants." Thus, unhappily, the progress towards a good understanding, and to a peaceful settlement of the difficulties, has received a rude check, and we cannot foresee what the end will be. It is little use asserting our good intentions. President KRUGER evidently will not believe in them, and what can we possibly do, more than we have done, to disabuse his mind? Nothing. He says pointedly and most significantly that the Government can suffer no interference or intermingling, *however well-intentioned*, in regard to internal affairs. Evidently he has got his back up, and we are completely confounded to know by what means we can get it down again. It is significant, however, that he should thus show his teeth simultaneously with the debate in the German Reichstag and the landing of a cargo of war material in the Transvaal. Hitherto we have praised his moderation and magnanimity. It seems that in this we have been a little too hasty, and, as Mr. CHAMBERLAIN suggestively remarked, "he may reject our advice under advice from sources which are, perhaps, not altogether disinterested, but if he does, in my opinion, he will not show the wisdom which has hitherto distinguished his action." President KRUGER will not tolerate any interference with his internal affairs. We have made no attempt to interfere. He has entirely—we will not say purposely—misunderstood us. We have offered him friendly advice, which, if he is not willing to accept, we have no desire to press. There are certain forces at work endangering the peace and existence of his Republic. We wish to assist him to combat and defeat those forces, but presumably he looks upon it as a veiled attempt on our part to use them for our exclusive benefit. Well, we will withdraw our advice. We will leave Mr. KRUGER to his own devices, and only intimate to him in no equivocal language that we will "use all legitimate influences to secure that justice which up to the present has been denied."

But let us whisper still more softly in his ears. We admit we have made an error, but it was made in all good faith, and without the suspicion of an intention of giving offence. The President has yet to learn who are his best friends. Has he never made a mistake in his life, that he cannot overlook that of others? We have invited him to come to England to talk over matters in a friendly spirit. This announcement was received with universal acclamation, and intense desire was manifested to give him a cordial and sincere reception. Is he blind to the significance of that? Can he detect veiled enmity in such an outburst of feeling? We have praised him unstintingly for his moderation and magnanimity. Have we been deficient in these qualities? Have we not borne with him for a long time? Has he not made promises he never intended to fulfil? Has not a petition, signed by 30,000 inhabitants, been scoffed and sneered at in the Volksraad? Has he not gone out of his way to burden those to whom he owes the prosperity of his Republic? And has he not ignored, beyond all human tolerance, the demands of justice? Our readiness, therefore, to overlook his past omissions; our anxiety to shake friendly hands with him; and our intense desire to assist him in defeating the inimical forces created by his own unjust conduct, should not be without its significance, and at any rate should prevail upon him to generously overlook the errors committed in the eager pursuit of friendly and laudable aims. We hope his shrewdness—that is, if he is deficient in psychological insight—will yet come to his aid, and will disabuse his mind as to our



intentions. If, on the other hand, he persists in his obstinate attitude, the voice of Justice will awake him with no gentle and soothing tones. Let him take this to heart. Time presses, and to-morrow, probably, it may be too late.

## NOTES AND COMMENTS.

THE latest intelligence which the shareholders in the Emerald Reward Gold Mining Company received at their meeting on Tuesday was, perhaps, not of so favourable a character as could have been desired, but, nevertheless, when it is considered that after starting with very excellent prospects, which, however, were not, unfortunately, realised, it must be admitted that the directors, acting at the unanimous request of the shareholders, have done wisely in purchasing the additional property. Pessimists may now think that those interested in the welfare of the company have only gone farther into the mire by entailing the extra expenditure, but all who know what might be termed the tediousness of mining operations can easily understand that sufficient time has not yet elapsed for the results of the exploration work to be arrived at. So far, the only encouraging information the directors are able to impart to the shareholders is that, according to the report of the new manager, Captain Penberthy, the lode is looking promising. In the meanwhile, as stated at the meeting, it is satisfactory to learn that though not a large one on account of everything having been charged to the revenue account, the balance is on the right side. Referring to the future prospects of the company, the somewhat startling nature of the announcement made by the Chairman, that if they failed to get any more payable ore out of the mines on their present property, it would be advisable to purchase the option for three or four months some desirable property in a neighbourhood where there are many valuable mines, was greatly discounted by the additional remark that even then they might become a prosperous company. Altogether, it seems that the judicious management of the company in the past will continue to prevail in the future, a very reassuring fact for shareholders to remember when passing through troublous times.

THE shareholders in the Coromandel Gold Mining Company of India must have been highly pleased with the very favourable statements made at the fourth annual meeting on Tuesday. The reserves of ore, the Chairman remarked, had been rapidly increasing during the past 12 months, and they now had sufficient quantity, without any further discovery, to keep the mill going, crushing 1000 tons a month, for the next two years. Although the capital of the company was diminishing, it was hoped that they would have sufficient to carry them on until the produce of the mine paid. Mr. John Taylor's lucid explanation of the development of the new chute on the Prospect shaft afforded much material on which to rely for an increased production in the future. Untold complications had had to be dealt with, but the excellent superintendent of the mines (Mr. Llewellyn) whose confidence in the mine was still undiminished, had, aided by his vast experience, exercised the utmost vigilance in the various matters, and so proved that the mine is not an expensive one to work. There is little doubt that in the near future the company will realise a good profit from the working of the mine, especially when it is remembered that not only is a new and valuable chute being quickly developed, but that the reserves of ore have also to be taken into consideration. The directors have every reason, therefore, to hold out the hope to the shareholders that their prospects are of a promising nature.

FROM all accounts, the shareholders of the Moanatairi Gold Mining Company seem to be in for a good thing, as not only is the mine which they possess situated in a very promising and rich district in New Zealand, but it is a company which in the past made for itself an excellent record. The statutory meeting of the company (which was registered last November) was held on Monday last, and though, of course, it was not possible in so short a time to lay before the meeting any record of a great amount of work, some most encouraging statements were delivered which certainly foreshadow a promising future. The capital of the company seems a large one, especially as only £25,000 is reserved for working capital. The speech of Mr. Witheford, who has been out in New Zealand, and who has a very extensive acquaintance with the locality in which the property is situated, was an extremely interesting and important one, and the facts which he produced are worthy to be recorded and dwelt upon. Of course, we no longer require any teaching as to the richness of the Thames gold field. Everyone is quite assured on this point, and though Mr. Witheford's statistics confirm the general conviction, they were none the less acceptable. Adjacent to the Moanatairi Mine are several properties which have paid large dividends, and which have turned out exceedingly rich stone, and as the mine is in the centre, as it were, of these rich properties it is natural to infer that the chances are greatly in favour of the Moanatairi turning out equally as successful. We have shown over and over again that one of the great drawbacks from which New Zealand has suffered in the past has been the working with primitive appliances. If, therefore, large dividends can be paid with old and obsolete plant, we may reasonably anticipate larger profits and dividends when new appliances are introduced and extensively employed. This is what Mr. Witheford thinks, and is one of the arguments upon which he bases a prosperous future for the company.

SOME people, whose impatience to grow rich outruns their propensity to sober judgment, are already enquiring with considerable importunity how it is that only a dozen out of the 500 West Australian mining companies are paying dividends. The enquiry thus brusquely formulated argues an unduly sanguine view as to the first possibilities of mining development. To look for dividends within twelve months of a company's registration is to expect too much from the future. No one having the

smallest acquaintance with mining would ignore the long and tedious work that it is necessary to carry out before a mine becomes profitable. There is the management to be organised, the machinery to be erected, the operations to be mapped out, and the large and necessarily unproductive preliminary works to be finished. The elaborate and complicated machinery necessary for working a mine cannot get into full working order without some rubbing of parts, and, perhaps, a false start or two at the commencement. And yet with all these considerations before them—with the initial procedure mapped out in the prospectuses and further detailed at the statutory meeting—some critics are "wanting to know" why, so far, no dividends have been paid. These fulsome complaints are devoid of any justification, and can only be made by people totally ignorant of the difficulties to be overcome and the constructive policy to be carried into effect before even the most promising mines begin to make dividend returns. Common-sense people must learn to discount something from the roseate statements advanced by those whose interest in the industry tends to overbalance their judgment, and at the same time to exercise a little patience on their own behalf.

MINING at Montana has achieved a record during the past year. The production has been the largest attained in the State's history, and the importance of Montana in the industrial economy of America gives the fact especial claims on our attention. It is, moreover, a circumstance to be fully borne in mind that at present only the best—or what are thought to be the best—of the mines in the neighbourhood have been attacked and worked; there is, consequently, still a large undeveloped field for future working, and the present record of the district may soon be left far behind. Compared with all previous stages in the Montana history, the present position there certainly gives us reason for feeling satisfaction with its present state, and for founding thereon the most sanguine expectations. As may easily be imagined, those among the local residents interested in mining are jubilant as to the way in which the States' mineral capabilities are opening up. Both the stock dealers and the engineers are struck happily enough with the way in which their most sanguine expectations have been surpassed, and with the view of forestalling any repetition of such an eventuality, they are spinning forecasts which, whatever else may be thought, certainly do not err in their excessive caution. There is, naturally enough, considerable justification for their *couleur de rose* anticipations, and while they are not, perhaps, justified up to the hilt, they will find, no doubt, substantial grounding in a considerable future increase in the output figures. The almost universal extent of the late mining revival, the introduction and perfection of efficient processes and methods, and, above all, the tried worth of the field itself, cannot but lead to splendid results, and the period may not be far distant when the Montana miner will be able to retort pithily upon the sceptics with the remark, "I told you so."

A PLATINUM industry is coming into being at New South Wales. That this particular colony is peculiarly rich in the useful minerals does not require proof, but the addition of platinum to the tale of the colony's products will be regarded with satisfaction by all who are interested in seeing New South Wales continue to progress in the line of prosperous industrial development, and not least by the sister Australasian colonies, who are all actuated by a spirit of wholly friendly rivalry such as admits the sentiment of sincere congratulation at a neighbour's success. The metal has previously been recorded as occurring almost exclusively between the Richmond and Clarence rivers on the Northern Coast, and about Broken Hill. Traces have occasionally been met with elsewhere, but not in any appreciable bulk. Before 1893, however, when the Fifield deposits were first opened up, there was no attempt to work the deposit upon a commercial scale. Once definitely commenced, moreover, the work was considerably retarded by dry seasons and the difficulties attending the prospecting works, there being nothing at surface to indicate in what direction the deposits might be found. From the present dimensions to which the industry has expanded, it may be safely gathered that the initial difficulties have been successfully combated. As we write, there are 7000 loads of the wash dirt dumped around the various claims, and awaiting treatment, and the yield up to the present of 1200 ounces—which is some 600 ounces below the gold output in the same district—will, no doubt, be largely increased upon in the early future. The deposit is large enough to encourage the establishment of a considerable industry.

It cannot be said that the recent deputation to the Home Secretary in support of an Eight Hours' Bill for miners has done much to further the realisation of the measure. However much people are agreed upon the view that eight hours at a stretch is a sufficient period for miners to spend in the earth's interior—and there is considerable agreement as to the matter—it requires no high gift of introspection to discover the disadvantages which would positively bristle all over a restrictive measure similar to the one forecast by Mr. Pickard. From the confidence with which such labour leaders as have espoused the cause state their case, the general public, in so far as they give any consideration at all to the matter, may be forgiven for supposing that there is something like unanimity among the miners in regard to the Bill. This is not the case, and, unless one is prepared to accept the sweeping dictum that a majority of any particular class are invariably able to form a right judgment on a matter where their interests are associated with those of other classes in the community, there is bound to be a full weight conceded to the position advanced by the minority. From the legislative point of view, it must be remembered that an Eight Hours' Bill for miners would be an entirely new departure, and innovating tendencies after this type require to be carefully matured before they can be carried into effect without

danger to the community. In its restriction of personal liberty, the measure has some hazardous characteristics, and soberly regarded, there is room for doubt as to whether the shorter hours for the men would sufficiently compensate for them. What it is now proposed to compel by legislative enactment has been voluntarily achieved in some Scottish districts by agreement between masters and men, and the fact certainly goes to show that, where the local mind is made up on the point in any particular district, there is no need for Parliamentary interference. In any case the Eight Hours' Bill has not much immediate chance of becoming law, and if the millennium is bound up with it that last consummation of human happiness will yet be delayed for some time.

MR. LOUIS JOHN MICHEL, who in the early days was officially proclaimed to be the first to discover and make known to the public an available gold field in Victoria, contributes to a colonial paper a highly interesting account of his experiences in connection with the explorations for the precious metals. The motive which led to the search was somewhat exceptional in character. Gold discoveries in New South Wales, as will be remembered by all who were born sufficiently early in the century, sent such a wave of excitement through Victoria that, under the attractive influences of the gold rush, the smaller colony seemed dangerously near depopulation by general exodus. The necessity of setting up a counter-attraction within Victoria itself led Mr. Michel and a companion into the wilderness to search for gold, and ultimately brought about the discovery upon which Mr. Michel founds his claim to have originated the Victorian industry. At the onset the difficulties encountered were sufficient to damp even the irrepressible ardour of an enthusiast, but Mr. Michel kept at his task in a manner he has himself described with considerable humour, and eventually successfully put his hand upon some grains of gold. This done, the imperative necessity for keeping his discovery secret dictated the greatest care to avoid attention, and it was not until official intimation was given in the capital town that gold finds had been made in Victoria that the fact became generally known. With all considerations in mind, it cannot be held that the £1000 granted by a grateful Government to the author of the discovery was an exaggerated recompense for the services done to the colony, and even to the industrial world, by the provision of a new field for industrial effort.

It is with peculiar interest that the members of the iron and steel trades peruse the official figures showing the position of our export trade during the opening month of the new year. It is highly satisfactory to find that, notwithstanding the numerous complications that have disturbed some of our leading foreign markets, we continue, compared with the corresponding period of 1895, not only to hold our own, but to make substantial headway. The exports of iron and steel during the past month reached a total of 227,807 tons, showing a remarkable improvement on the 166,711 tons for January of last year, and the 161,804 tons in the corresponding month of 1894. The values, on comparison, show a similar expansion, the returns for the month in each year being:—1896, £1,716,072; 1895, £1,351,086; 1894, £1,406,963. The following particular items show an increase for the month:—Pig and puddled iron, 64 per cent.; bow, angle, &c., 30 per cent.; railroad iron, 108 per cent.; wire, 17 per cent.; telegraphic wire, 62 per cent.; cast and wrought iron, 26 per cent.; old iron, 113 per cent.; unwrought steel, 78 per cent.; galvanised sheets, 49 per cent. A decrease is recorded in the following:—Hoops and sheets, 20 per cent.; tinplates, 22 per cent.; and unwrought tin, 6 per cent. The following are the values for the month of January in 1895 and 1896 respectively:—Pig and puddled iron, 1895, £82,154; 1896, £135,390; bar, angles, &c., £64,470, £84,010; railroad, £102,822, £211,903; wire, £54,829, £64,397; telegraphic wire, £35,193, £57,224; cast and wrought, £30,739, £389,801; hoops, sheets, £53,962, £42,766; old iron, £11,561, £24,686; steel unwrought, £107,648, £191,763; galvanised sheets, £147,517, £220,239; tinplates, £347,047, £268,368; tin unwrought, £35,673, £33,293.

It is satisfactory to see that the colonial mind requires no awakening on the necessity of providing the means for a thorough grounding in theoretical and applied mineralogy for all who propose to devote themselves to mining pursuits as a profession. At Ballarat and Bendigo, in Victoria, and at Sydney, in New South Wales, there have been schools in existence for some time, and certificates of competency are granted after Governmental examination. The teaching staff has been economically formed, but its working is efficient and practical, and instruction is given in all the usual branches of the profession—chemistry, metallurgy, assaying, geology, and mineralogy. Queensland, almost alone among the more important and older colonies, is without its mining school; but several proposals are now afoot to supply the defect, and aid will, no doubt, be accorded by the State to any really sound and practicable scheme for founding a school. The general aim of a good mining school has been very well put by the Under-Secretary of Mines for New South Wales, who, in his report for 1894, remarked:—"It is hoped that the establishment of the School of Mines will result in the gradual improvement in the methods of mining, as practised in this colony, by providing a class of managers who will have had the advantage of a thorough scientific training, and who will only need a few years' practical experience to qualify them as mining engineers of the highest efficiency. The ultimate result must be an increased development in the mining industries of this country." After a summary of the advantages derivable from the school there is hardly a necessity to labour the matter—more especially as our own views have been frequently expressed—and, in conclusion, we can only express satisfaction at the general disposition to look at the matter in the right light.



It has been the custom in many quarters to point an admiring finger at the tender solicitude with which the French authorities foster, guard, and patronise in every possible way the commercial enterprises of their nation. The advantages attending the connection between officialism on the one hand, and the initiative of individuals in industrial matters on the other, are commingled, however, with disadvantages which are obvious enough. Anything which tends, even in a remote way, to limit the spirit of self-dependence among commercial men is in itself a great evil, and it is open to the very gravest doubt as to whether the compensating advantages are sufficient to neutralise it. The economical and industrial history achieved by the English in South Africa offers a curious contrast to the record written by other nations, in so far, of course, as they can be said to have had any history of the sort. In our own regard, every territorial expansion and every new commercial departure has been taken without the slightest help from the home authorities—we had almost said in spite of them. The sharp contrast between this indifference and the far-reaching officiousness of the French and German Governments, in their wish to control the expansion of the commerce of the two nations, is very marked. These two countries have learned to their sorrow that colonies are, or should be, something more than mere territorial possessions, and that it is quite impossible to manufacture a colonial spirit by mere bureaucratic enactment. So that, on the whole, though there could be found in past events matter enough to formulate a direct and pithy indictment against English colonial methods, there is at least consolation in the reflection that it is better to err upon the side of *laissez-faire* than upon that of grandmotherly interference.

Some interesting experiments in underground temperature have recently been carried out with great thoroughness and care by Professor Agassiz at the Calumet and Hecla Mines, and the close bearing of the question upon deep level mining all over the world, but more especially in South Africa, lends considerable significance and interest to the results. The observations have been effected by means of slow-registering Negretti and Zambra thermometers, and have been taken at various depths from 105 feet—where the variations due to local changes of temperature may be taken to have ceased—down to 4580 feet. The results, which differ materially from any previously recorded, are worth examination and even study. At the various points in depth selected for the investigation holes were drilled to a depth of 10 feet below the face of the rock, the thermometer then inserted, and the borings subsequently plugged with clay. The deepest point at which an observation was recorded was at 4580 feet, and here the temperature stood at 79° Fahr., or 20° higher than at the 105 feet station. "This," remarks Professor Agassiz, not altogether, perhaps, without some tinge of melancholy, "is very different from any recorded observations. Lord Kelvin, if I am not mistaken, giving as the increase 1° Fahr. for 51 feet, while results based on temperature observations of the St. Gothard Tunnel gave an increase of 1° for every 60 feet." These results suggest the much more difficult problem of eliminating from the observations those modifications due to other causes than local changes in surface temperature.

## THE MINING MARKET.

FRIDAY EVENING.

A strong beginning with the New Account succeeded by a reaction and dulness.—Indians and New Zealand gold shares conspicuously good.

THE Mining Market has been the scene of considerable activity this week, and when dealings for the New Account were fairly under way on Monday and Tuesday, so marked a rally in prices had been brought about as fairly to extinguish the losses consequent upon Dr. Jameson's raid and the New Year upheaval in the Transvaal. To no small extent the closing operations of bears were responsible for this remarkable change of tone, and as during the last day or two the Kaffir Market has developed a sagging tendency, it may be concluded that the general public did not come in on the rise to any very great extent. When we were writing a week ago, prices were hardening up in the Street dealings in a way that quite prepared shrewd followers of the market for the buoyancy that characterised dealings on Saturday. When the market opened, there was a rush of buying orders, and bears who had previously refrained from covering proceeded to do so at once. A large share of the interest was centred in Chartered, which were in strong demand on an announcement in the *Times* with regard to Mr. Rhodes's intended line of action. When the shares had put on half a point or so, recent buyers began to realise, bringing about a temporary reaction, but there was a strong rally before the finish, and the last prices were the best. Land and Gold shares combined in a general advance. Matters were fairly active in West Australians, buyers and sellers being equally divided, but some appreciable gains were scored in the Miscellaneous Market, more particularly in New Zealand, Chartered Towers, and Indian Gold shares. Monday was making-up day for mines in connection with the mid-February Settlement. Kaffirs were positively booming, Chartered at one time showing a rise of nearly £1 on the day. Buying orders were received from the Continent, and many market operators, who were known to be bears, turned round on the bull tack. The making-up list showed some big gains as the result of the fortnight's dealing. The rates were not appreciably higher than last time, except in the case of Chartered, on which a contango was charged, suggesting the virtual extinction of the bear account. The carry over was arranged without difficulty, and brokers and dealers were quickly at work on bargains for the New Account. The market was wide and excited, and street dealings continued until a late hour, some big advances having been established all along the line. An increased business was reported in West Australians, and prices were harder. New Zealand shares were conspicuously strong. Broken Hills were dull, but Indians had a further advance. On Tuesday Kaffirs opened with a firm tone, and a big business was done during the morning, but during the afternoon Continental selling caused a check, giving a start to realisations on the part of recent buyers on this side. The January output at the Rand was announced,

and considered satisfactory under the special conditions. Kaffir prices at the close were irregular, gains and declines being about equally divided. West Australians were cheerful throughout, although no important gains were scored. Renewed activity characterised the Miscellaneous Market, New Zealand and Indians leading the way. On Wednesday the Kaffir Market opened dull, but prices strengthened during the morning, only to ease off again on the receipt of lower prices from Paris. West Australians were well supported, and several fair advances brought about. Indians were bought amid a good deal of excitement under the lead of Mysore, and New Zealanders were buoyant. On Thursday the Kaffir market opened rather better, and the highest prices were marked in the first hour's business. The market closed dull, though losses were not important. There was a distinct increase of business in West Australians at hardening prices. Mysore were exceptionally easier on realisations, although other Indians hardened up. New Zealand continued strong, whilst Broken Hills were weak. There was a noticeable demand for copper shares under the lead of Rio Tinto. Things have been very quiet to-day in the absence of fresh support. For the moment there does not appear to be much to go for, bear closing having come to an end.

### South Africans.

The January output at the Witwatersrand was announced on Tuesday at 148,178 ounces—a decrease of 30,250 ounces in comparison with December. This was better than had been anticipated, a loss of quite 50,000 ounces being spoken of as probable owing to the week's check to mining in the early part of the month. It can hardly be said that this announcement had any immediate effect upon the market, which had already taken its reactionary turn after the remarkable rise of the two preceding days. The subjects which have been made the most of as pretexts for moving the market have been Mr. Rhodes's sudden departure on Monday, the questions and debate regarding the Chartered Company in the House of Commons, and the publication of the official despatches relating to the Transvaal difficulty. Bulls and bears have put their own construction upon each phase as it has been brought to notice day to day, and it would be extremely difficult to trace out a coherent argument on one side or the other. So quickly do the opposing parties turn round in their appreciation of conflicting points. The market is much less dependent than it has been upon the purely political aspect of the situation. Whereas a month ago all sort of statistical information was stopped, the supporters of the various companies are now regaled as of old with mining reports and financial statements. We left Chartered a week ago at 4½. On Monday they opened at 4½, and after some fluctuation closed at 4½. The first price on Monday was 5½, the report that President Kruger had accepted an invitation to visit London, coupled with Mr. Rhodes's departure, being construed favourably by speculators. The making-up price was fixed at 5½, or £2 higher than at the preceding Settlement, and dealings actually took place at 5½. The contango varied from 4d. to 6d., showing that the bear account no longer preponderated. On Tuesday morning the shares were firm at 5½, but gave way during the afternoon, the last price being 5½. After some moderate fluctuations on Wednesday, the price was finally 5½, and on Thursday morning during a spurt they touched 5½, but this morning, Thursday's debate in Parliament and the less amicable tone of President Kruger's utterances prompted sales, on which the price quickly fell to 4½. A recovery to 4½ leaves them ½ up on balance. Goldfields Deferred rose ½ on Saturday to 11½, the shares being made up at 12½ on Monday, when the contango averaged about 5 per cent. On Tuesday morning the shares were dealt in at 13½, receding before the close to 12½. There was less doing in them on Wednesday, and on Thursday they were inclined to be flat, finishing below 12½. The last price (12½) shows a gain of ½. Gold Truists ran up from 8½ to 9½, though in the last price (8½), the week's gain is reduced to ½. Gold Fields Deep were up to 10 on Tuesday morning, closing ½ higher on balance at 9½. In the Barnato group the most marked advance is shown in Johannesburg Investments, which stood at 3½ when we last wrote. These shares touched 4½ on Monday, in anticipation of the dividend which was not officially announced until Thursday. The distribution is to be 3s. per share, or at the rate of 30 per cent. per annum, which is 1s. more than for the corresponding half of 1894. The last price 4½ shows a gain of ½. Buffelsdoorn have put on ½ at 3½, having in the meantime been up to 4½. The January output was returned at 3625 ounces. Dividends of 2s. 6d. and 5s. have been deducted in the case of Glencarin and New Primrose respectively which leaves them slightly higher at 4 and 6. Crosses after going over 2, closes ½ up at 1½. George Goch have lost their intermediate improvement, and close at 2½. Kimberley Roadport have steadily improved during the week, and close a full point up at 2½. Another conspicuous gain is that of ½ in Langlaagte Royal at 2½, which, however, is still below the best price touched. Rietfontein have scored ½ at 4½, a somewhat sensational discovery being reported from the mine. Spes Bona after touching 2, are ½ higher at 1½. Barnato Consols have put on ½ at 3½, and the Banks ½ at 1½. In the Robinson group, Randfontein have naturally attracted most attention. The shares went to 3½ on Monday, but are finally ½ down at 2½. Langlaagte are rather easier at 6, making allowance for the 5s. dividend deducted. Block B has put on ½ at 2½ and Robinson Banks are £1 better at 7. A large business has been done in East Rands, which were run up to 7½ on Monday, but close only ½ to the good at 6½. St. Angelo have improved ½ at 4, after rising to 4½, and Comets are unchanged at 2½. The Goldenhuis Deep crushing of 3,300 ounces works out at nearly 5 dwts. to the ton, which is considered more satisfactory. The shares are ½ up at 6½. Rand Mines are considerably below the best at 28½, which is still 2½ above last week's price. Nourse Deep have scored ½ at 5, and other Deep Level shares maintain last week's prices. Simmer and Jack improved to 22½, but have reacted to 21, which marks a gain of half a point. Cities at 5, Ferreira at 17½, Goldenhuis at 4½, Jubilee at 9, Henry Nourse at 6½, Heriot at 9, ex 5s. dividend, and Jumpers at 7½, are all within ½ of last week's prices, and the same may be said of Wemmers at 10½, allowing for the deduction of 20s. dividend. Improvements of half a point are shown in Nigel at 5, and Salisbury at 4, whilst Modders are finally ½ better at 10½, after improving to 11½ in the early part of the week. Knights were up to 7½ at one time, closing ½ to the good at 6½. Bantjos have managed to retain the best part of their spurt, finishing ½ up at 3½. A big rise took place in Apex, which, after touching 11, are still two points to the good at 9½. Clewors put on ½ at 2½, as did Kleinfontein at 4½. A noticeable movement is the rise of ½ in Sheba to 2½, on the publication of a month's output exceeding 10,000 ounces, as compared with 6000 ounces for the preceding month. Increased attention has been given to the little Johannesburg Goldfields, which are higher at 8s. 6d., and are worth the attention of small investors who are content to wait for their profit. The Van Ryn group closes appreciably below the best. The

shares of the parent company at one time touched 7, closing at 6½, with Westa ½ up at 3½. Wolhuter has improved ½ to 8½, Village Main Reef ½ to 6½, Minerva ½ to 1½, Afrikaander ½ to 1½, and Crown Reef ½ to 10. A gain of £1 is shown in Transvaal Gold at 6½, and advances are found in most of the small Lydenburg shares, amounting to as much as 4s. in Lydenburg Estates at 1½, Spitzkops at 20s., and Barretts at 13s. Rhodesian properties have all sympathised with the advance of Chartered. The most remarkable advance is in Rhodesia Exploring, which put on £4 in two days, and closes 3½ up, at 9½. Rhodesia Limited, at ½ premium, have lost nearly half their previous gain. Henderson's went over 3½ on Tuesday, closing only ½ to the good at 2½. Tati Concessions are ½ higher, at 2½. New Africans have improved ½ to 4½, Austral Africans ½ to 1½, and Oceana ½ to 2½. The deduction of a 20s. dividend from the price of Zambesia Exploring leaves the shares ½ up at 3 ex div. A bigish business has been done in Klerksdorp, which are finally 1s. higher at 16s. 9d. Exploring Land and Minerals have gained ½ at 1½, and London and African Exploration £1 at 14, whilst Mashonalad Agency are ½ up at 2½. There has been no special excitement in Diamond shares, and De Beers never went over 26½, closing practically unchanged at the figure, whilst Jagers are on last week's mark at 9½.

### West Australians.

The account in West Australians was easily settled on Monday, continuation rates averaging a halfpenny to one penny in the £. The most noticeable movement of the week took place on Wednesday, when Hannan's Brownhills jumped up 10s. on the receipt of a private cable, stating that the dry crushing process was proved to be successful. The shares have since reacted to 7½, which leaves them ½ up on balance. A very satisfactory report from the Associated Mines was published on Wednesday, and the shares have been in good demand throughout the week, closing ½ better at 2½. Hannan's North have been brought up to 1½, closing firm at 1½. True Blues are ½ better at 2, and Great Boulders have put on ½ at 6½, whilst Hannan's Reward are ½ down at 3½. The feature of Thursday was the rise in Lake View to 2½. The shares are finally ½ up at 2½. It is stated that the company will shortly be converted into an English one. Some reaction is shown in the Monzie's group, Mining and Exploring closing ½ down, whilst Reefs are unchanged at 1½. Hampton Plains are the turn harder at 4½, and a small gain is shown in White Feathers at 2½. The crushing return of 1523 ounces shows an average yield of 2 ounces 2 dwts. per ton. Murchison New Chums also published a crushing of 1015 ounces, showing 3½ ounces to the ton. The shares, however, are lower at ½. West Australian Mining have been up to 10s. 6d., closing 9½ higher on the week at 10s. 3d. Westralia Limited has scored ½ at 1½, and Mines and Banking a like fraction at 1½. London and Globe Finance touched 3 on Wednesday, closing a shade under the figure, whilst a large business has been done in Colonial Finance, which closes ½ down at 5½. London and West Australian Investment is ½ up at 2½, West Australian Gold Fields unchanged at 6½, and Exploring and Finance ½ down at 3½.

### Miscellaneous.

The lion's share of interest in this department has been secured by Indian gold shares. On Wednesday Mysore were within a shade of 5 on the issue of a circular by the company reporting that for the past two or three months the "clean-ups" had been so satisfactory that over and above the published returns there was an accumulation of 7000 ounces of gold, valued at £27,000. This announcement was adversely criticised subsequently, operators arguing that with such reservations the monthly statements became unreliable and accordingly valueless. The shares are, nevertheless, ½ higher on balance at 4½. Champion Reefs have gained ½ at 5½, Oregum ½ at 3½, the preference ½ at 3½, Nundydroog ½ at 2½, and Gold Fields of Mysore 2s. at 22½. The New Zealand group comes next in point of popularity. Hauraki gave the lead on Saturday, advancing to 12s. on the announcement of a crushing of 2059 ounces. On Monday the shares went to 13s. 9d., and on Wednesday to 15s. 9d., Paris coming in as a buyer. Kapangas were bought up to 10s. on Monday and Tuesday, operators remembering that the company has over £50,000 working capital in hand. Waihi marks a gain of ½ at 6½, and Waitekauri has put on nearly 10s. at 4½. In the Charters Towers Group attention has been drawn to Day Dawn Blocks, for which we have more than once had a good word as a low-priced share likely to increase in value. The price to-night is 3s. up at 12s. 6d. Mills Day Dawn announces a crushing of 1186 ounces, the price being firm at ½. Brilliant Blocks have given way and are no better than 1½. Throughout the week Broken Hills have been flat on Australian selling, and the price is finally ½ down at 2½. Cripple Creek Exploration have given way half a point to 2½. Wentworth's are ½ up at 1½ on the 700 ounce crushing and Aladdins have recovered their 1s. dividend. Copper shares have been firm, Tintos closing ½ higher at 18½, with Libiola ½ up at 3.

### STOCK EXCHANGE SETTLING DAYS.

Settling Days on the Stock Exchange are as follows:—  
CONSOLS, Monday, March 2.  
STOCKS AND SHARES.

### FEBRUARY.

Wednesday, February 26 | Thursday, February 27

### MARCH.

Wednesday, March 11 | Thursday, March 12  
Thursday, March 26 | Friday, March 27  
Contango Days for Mining Market:—  
Monday, February 24 | Monday, March 9  
Tuesday, March 24

IS THERE A GROUP OF INACTIVE ELEMENTS?—During a piece of pure analytical reasoning, Julius Thomsen has recently formulated the hypothesis that there exists a group of inactive elements hitherto unsuspected. The lines of thought by means of which he has reached this conclusion (says the *Electrical Review*) are the following:—If the chemical character of the elements is a periodic function of the atomic weights, such a function must follow the ordinary general laws. In the periodic functions, the change from negative to positive values, or the reverse, can only take place by a passage through zero, or through infinity; in the first case the change being gradual, and in the second case a sudden one. The first case corresponds with the gradual change in electrical character with raising atomic weight in the separate series of the periodic system, and the second case corresponds with the passage from one series to the next. If, therefore, appears that the passage from one series to the next in the periodic system should take place through an element whose electrical character is  $\pm \infty$ , and which is, therefore, electrically indifferent. The valency of such an element would be zero, and, therefore, in this respect also it would represent a transitional stage in the passage from the univalent electro-negative elements of the seventh to the univalent electro-positive elements of the first group. This indicates the possible existence of a group of inactive elements with the atomic weights 4, 20, 36, 84, 132, and 212. The original paper may be consulted in the *Zeitschrift für Anorganische Chem.* 9, 283-288.



# "THE MINING JOURNAL" SHARE LIST.

ABBREVIATIONS AND REFERENCES.—The following are the significations of the abbreviations and references which occur in the Share List:—A, Antimony; As, Arsenic; B, Blende; Br, Borax; C, Copper; D, Diamond; G, Gold; I, Iron; L, Lead; M, Manganese; N, Nitrates; P, Phosphates; Q, Quicksilver; R, Ruby; S, Silver; S-L, Silver-lead; Sul, Sulphur; T, Tin; and Z, Zinc. \* in the "Amount of Share" column of British Mines signifies that the mine is conducted on "Cost Book" principles; † in the "Head Office" column of African Mines signifies that the address given is not that of the head office, but of a sub, or transfer office; and ‡ following the names of African Mines, signifies that they are subject to the Limited Liability Law of the South African Republic.

The following is by far the most complete and comprehensive list of mines, in whose shares business is being currently transacted, published. Additions will be made from time to time as occasion requires. Every effort is made to ensure accuracy, and Secretaries of Companies, Share Dealers, and our readers generally, are cordially invited to co-operate with us to this end, by notifying us of any errors that may at any time occur. We desire it to be understood that, while our Share List will almost invariably be found correct, we do not hold ourselves responsible for any loss or inconvenience that may arise from possible inaccuracies.

## AFRICAN MINES.

## AFRICAN MINES—(Continued).

Name.	Opening Price, Feb. 14, 1896.	Closing Price, Feb. 7, 1896.	Am't. of Share.	When last X'd and Dividend.	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office.
Abbott's Con. Reefs	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	Broad Street Avenue.
Alder Consolidated	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	1, Moorgate place.
African Estates	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	3, Cophall-buildings
" Gold Revy.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	16, Tokenhouse-yard
Africana	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Alexander	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	34, Clement's lane
Anglo-French Exp.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Matabeleland	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Apprentice	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Aurora	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" West United	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Austral African	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Baika Eerating	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Land	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Bantjes Consl.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Barnato Bank	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Coal	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Barroo	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Bechuanaland Exp.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Trad g. & Soc.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Ben Frovato	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Big Golden Quarry	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Block "B" Lang.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Bonanza	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Brit. S. A. Cons.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Buffelstroom	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Central	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Consolidated	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Cape Asbestos	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Copper	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" 5% Pref.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Cassell Cons.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Cen. de Kamp	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Roodt's Deep	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Champ d'Or	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Charterland G.F.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Chimes West	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
City and Sub. N.W.G.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Con. Bultfontein	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Con. Deep Level B	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Con. G. Fields B	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Con. 5% Pref.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Do. 5% Deben.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Crown Deep	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Reef	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
De Beers Consol.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Do. 5% 1st Deb.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Do. 5% 2nd Deb.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Doornkop	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Driefontein	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Durban Roodtph.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Deep	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Eastleigh	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
East Orion	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Rand	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Evelyn	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Exploration	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Exploring L & M.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Ferreira	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Forbes Reef (N.W.G.)	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Goldenbulb Deep	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Goldenbulb Est. G	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Main Reef	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
George Goch	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Gingberg New G	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Glencairn	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Gld. Fls. Deep	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
G.F. of Lydenburg	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
G.F. of Mafeking	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Graskop	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Griqualand W.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Heidelberg. Est. Ex.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Gold	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Henderson's Trans	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Henry House	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Hetty	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Joe's Reef	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Johannesburg Invit	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Pioneer	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Jubilee	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Jumpers	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Deep	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Kimberley	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Rdp.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Klerksdorp	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Knight's Deep	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Kofffontein	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Lancaster	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Langlaagte Est. G	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Royal	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Star	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Lisbon-Berlyn	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Lon. Paris Fin & M.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
London & S. A. Ex.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Louisa's Reef	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Lydenburg Estate	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Ld & Expt	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" M.G. Est.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Main Reef (New G)	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Malmadi Gold Byn	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Marie Louise	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Marivalde Nigel	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Mashon Agency	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Central	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Matabeleld G. R.I	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
May Cons. (New G)	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Meyer & Charl.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Minerva	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Min. Selection	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Modderfontein	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" B" Estens.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Molyneux Consol.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Moodies G.E.E.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Mosambique	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
Namaqua	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
New African	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Chimes	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Clever Estate	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Comet	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Crossed	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Gordon	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Heriot	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Jagersf.	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Kleinfontein	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Midas	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Primrose	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Rietfontein	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" S. Argentin	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Spec. Bona	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill
" Steyn Estate	1/4 1/2	1/4 1/2	1 0	—	—	—	De Kaap	23, College Hill

## BRITISH MINES.

## EUROPEAN MINES.



AUSTRALIAN AND NEW ZEALAND MINES—(Continued).

Name	Closing Price, Feb. 14, 1896	Closing Price, Feb. 7, 1896	Am't of Share	When last X'd and Dividend	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
"A. General.....	4 1/2	4 1/2	1 0	—	0 14 0	—	W. Austral Coalgardie	26, St. Swithin's-lane
"Australian C.P.	5 1/2	5 1/2	1 0	4/- Dec 16 '95	1 0 0	65,000	W. Austral	23, 29.
"Mines Div	1 1/2	1 1/2	1 0	10/ Oct 30, '95	1 0 0	40,000	W. Austral	3, Princes Street
"Aust. Mining	8 1/2	8 1/2	1 0	5 Oct 16 '95	1 0 0	104,141	"	267, Winchester Ho.
"Aust. Pioneer.	2 1/2	2 1/2	1 0	10 Oct 19 '95	0 15 0	19,993	"	139, Cannon-street.
"Share Corp.	1 1/2	1 1/2	1 0	—	0 5 0	230,000	"	26, St. Swithin's in
"Trust.....	3 1/2	3 1/2	1 0	—	1 0 0	50,000	"	54, Old Broad Street
"Venture.....	3 1/2	3 1/2	1 0	15/ Oct. 30 '95	1 0 0	—	"	3, Princes Street.
"West Boulder	1 1/2	1 1/2	1 0	—	1 0 0	—	"	Winchester House.
"White Feather	2 1/2	2 1/2	1 0	—	1 0 0	60,000	Coalgardie	23 & 23, S. Swithin's in
"United	3 1/2	3 1/2	1 0	—	1 0 0	75,000	"	139, Cannon-street
"Whitehead & Sultan	3 1/2	3 1/2	1 0	—	0 5 0	150,000	"	13, Abchurch-lane.
"Zapopan	6/-	6/-	1 0	—	1 0 0	25,000	NW Austral	70, Bishopgate-street
"Zeehan Montana S	6/-	6/-	1 0	—	1 0 0	65,000	Tasmania	11, Queen Victoria st
"Zeehan Montana S	6/-	6/-	1 0	—	2 6	12,000	"	"

Name	Closing Price, Feb. 14, 1896	Closing Price, Feb. 7, 1896	Am't of Share	When last X'd and Dividend	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
Alaska Mexican.....G	1 1/2	1 1/2	1 0	4-5d. Feb. '96	5	160,000	Alaska.....	30, St. Swithin's-lane
"TreadwellG	5 1/2	5 1/2	1 0	1/6 Dec 24, '95	5	200,000	"	"
Anglo Mexican.....G	15/ 17/	15/ 17/	5 0	2/- Dec 30 '95	5 0 0	74,850	"	23, College Hill.
"Arizona (Prof.) Cu	45/8 46/8	47/8 48/8	100 0	4/ 1/6 Feb. 13, '96	100 0 0	155,300	Arizona...	74, Geo.-st., Edinbu.
"6% A Deben.	106 1/2	107 1/2	100 0	1/2 Oct. 30 '95	100 0 0	4135,300	"	"
"7% B Deben.	94	95	100 0	7/2 Oct. 30 '95	100 0 0	4181,300	"	"
De Lamar.....GS	15/6 16/6	16/6 17/6	1 0	1/- Feb. 13 '96	1 0 0	400,000	Idaho.....	6, Drapers-gardens.
Dickens CusterGS	1/6 2/-	1/6 2/-	1 0	—	0 19 9	420,000	"	Winchester Ho. E.O.
Doric.....G	4/8 5/-	4/9 5/3	5/-	—	0 5 5	125,000	Colorado...	"
Elkhorn Priority S	par 1/2 pm.	par 1/2 pm.	1 0	-3 June 26 '96	6 10 0	175,007	Montana	6, Draper's-gardens.
Gen. M'g. Assn.,	6 1/2	6 1/2	5 10	10/- Apr. '95	5 10 0	27,469	C. Breton	Blomfield House.
Golden Feather G	8/6 9/8	8/6 9/8	1 0	—	1 0 0	180,000	California	8, Stephens Cs E.O.
"Gate.....G	2/6 3/8	2/6 3/8	1 0	—	0 19 6	79,600	"	"
"Leaf.....G	1/- 1/8	1/- 1/8	1 0	—	1 0 0	300,259	Montana	8, Draper's Gardens.
Harquahala.... G	6/5 7/8	7/ 8/-	1 0	-6 Nov. 14, '94	1 0 0	300,000	Arizona ..	6, Draper's Gardens.
Holcomb Valley G	1/3 1/9	1/ 1/8	5/-	—	0 5 0	540,000	California	14, Cornhill, E.C.
Jackson Goldfields	1/9 1/3	1/9 1/3	5 0	—	0 5 0	408,635	"	11, Poultry, E.O.
Jay Hawk (New)G	-3/ 1/9	-3/ 1/9	1 0	-6 Dec. '92	0 19 3	285,000	Montana	Dashwood House.
La Plata.....S	1/ 1/8	1/ 1/8	5/-	1/3 Oct. '82	0 4 8	405,000	Colorado	11, Poultry, E.O.
La Yasca.....GS	2/- 2/6	2/ 2/6	1 0	—	0 19 8	200,000	Mexico ...	20, Bucklersbury, E.O.
Lyonnais Mexican	1 1/2	1 1/2	1 0	—	1 0 0	140,500	"	3, Broad St. Bldg.
Montana.....GS	7/6 8/6	7/6 8/6	1 0	-3 Dec. 30, '95	0 19 0	657,158	Montana	Gresham House, E.O.
New Guston .....S	3/4 3/4	3/4 3/4	1 0	1/- Oct. '92	1 0 0	110,000	Colorado	25A, Old Broad-st.
Palmarajo .....GS	1/3 1/9	1/8 1/	1 0	—	1 0 0	415,998	Mexico ...	32, Old Jewry, E.O.
Pinos Altos (D)GS	3/4 3/4	3/4 3/4	1 0	-6 Mar. '90	1 0 0	100,000	"	110, Cannon-street.
Richmond .....GS	3/4 3/4	3/4 3/4	5 0	1/- Dec. 16 '95	5 0 0	54,000	Nevada ...	44,

Name	Closing Price, Feb. 14, 1896	Closing Price, Feb. 7, 1896	Am't of Share	When last X'd and Dividend	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
" A. General.....	4 1/2	4 1/2	1 0	—	0 14 0	—	W. Austral Coalgardie	26, St. Swithin's-lane
" Australian C.P.	6 1/2	6 1/2	1 0	4/- Dec 16 '95	1 0 0	65,000	W. Austral	23-29, "
" " Mines Div	1 1/2	1 1/2	1 0	10/ Oct 30, '95	1 0 0	40,000	W. Austral	3, Princes Street
" " Aust. Mining	8 1/2	8 1/2	1 0	5 Oct 16 '95	1 0 0	104,141	"	267, Winchester Ho.
" " Aust. Pioneer.	2 1/2	2 1/2	1 0	10 Oct 19 '95	0 15 0	19,993	"	139, Cannon-street.
" " Share Corp.	1 1/2	1 1/2	1 0	—	0 5 0	230,000	"	26, St. Swithin's in
" " Trust.....	3 1/2	3 1/2	1 0	—	1 0 0	50,000	"	54, Old Broad Street
" " Venture.....	3 1/2	3 1/2	1 0	15/ Oct. 30 '95	1 0 0	—	"	3, Princes Street.
" West Boulder.....	1 1/2	1 1/2	1 0	—	1 0 0	—	"	Winchester House.
" White Feather.....	2 1/2	2 1/2	1 0	—	1 0 0	60,000	Coalgardie	23 & 23 S, Swithin's in
" " United.....	3 1/2	3 1/2	1 0	—	1 0 0	75,000	"	139, Cannon-street
" Whitehead & Sultan	3 1/2	3 1/2	1 0	—	0 5 0	150,000	"	13, Abchurch-lane.
" Zapopan.....	6/-	6/-	1 0	—	1 0 0	25,000	NW Austral	70, Bishopgate-street
" Zeehan Montana S	6/-	6/-	1 0	-4 Dec. 95	1 0 0	65,000	Tasmania	11, Queen Victoria st
" "	—	—	1 0	2 1/2 Dec. 95	0 2 6	12,000	"	"
NORTH AMERICAN MINES.								
Alaska Mexican...G	1 1/2	1 1/2	1 1/2	4-5d. Feb. '96	\$5	160,000	Alaska.....	30, St. Swithin's-in
" Treadwell G	5 1/2	5 1/2	5 1/2	1/6 Dec 24, '95	\$25	200,000	"	"
Anglo Mexican.....	15/ 17/	15/ 17/	5 0	2/- Dec 30 '95	5 0 0	74,850	"	23, College Hill.
" Arizona (Prof.) Cu	45/8 46/8	47/8 48/8	100 0	4/ 1/6 Feb. 13, '96	0 0 0	155,000	Arizona...	74, Geo.-st., Edinbu.
" " 6% A Deben.	106 1/2	107 1/2	100 0	1 1/2 Oct. 30 '95	100 0 0	4135,300	"	"
" " 7% B Deben.	94	95	100 0	7 1/2 Oct. 30 '95	100 0 0	4181,300	"	"
De Lamar.....GS	15/6 16/6	16/6 17/6	1 0	1/- Feb. 13 '96	1 0 0	400,000	Idaho.....	6, Drapers-gardens.
Dickens Custer GS	1/6 2/-	1/6 2/	1 0	—	0 19 9	420,000	"	Winchester Ho. E.O.
Doric.....G	4/8 5/-	4/9 5/3	5/	—	0 5 5	125,000	Colorado...	"
Elkhorn Priority S	par 1/2 pm.	par 1/2 pm.	1 0	-3 June 26 '96	6 10 0	175,007	Montana	6, Draper's-gardens.
Gen. M'g. Assn. ....	6 1/2	6 1/2	5 10	10/- Apr. '95	5 10 0	27,469	C. Breton	Blomfield House.
Golden Feather G	8/6 9/8	8/6 9/6	1 0	—	1 0 0	180,000	California	8, Stephens Cs E.O.
" Gate.....G	2/6 3/8	2/6 3/8	1 0	—	0 19 6	79,600	"	"
" Leaf.....G	1/- 1/8	1/ 1/8	1 0	—	1 0 0	300,259	Montana	8, Draper's Gardens.
Harquahala... G	6/5 7/8	7/ 8/	1 0	-6 Nov. 14, '94	1 0 0	300,000	Arizona ..	6, Draper's Gardens.
Holcomb Valley G	1/3 1/9	1/ 1/8	5/	—	0 5 0	540,000	California	14, Cornhill, E.C.
Jackson Goldfields	1/9 1/3	1/9 1/3	5 0	—	0 5 0	408,635	"	11, Poultry, E.O.
Jay Hawk (New) G	-3/ 1/9	-3/ 1/9	1 0	-6 Dec. '92	0 19 3	285,000	Montana	Dashwood House.
La Plata.....S	1/ 1/8	1/ 1/8	5/	1/3 Oct. '82	0 4 8	405,000	Colorado	11, Poultry, E.O.
La Yasca.....GS	2/- 2/6	2/ 2/6	1 0	—	0 19 8	200,000	Mexico ...	20, Bucklersbury, E.O.
Lyonnais Mexican	1 1 1/2	1 1 1/2	1 0	—	1 0 0	140,500	"	3, Broad St. Bldg.
Montana.....GS	7/6 8/6	7/6 8/6	1 0	-3 Dec. 30, '95	0 19 0	657,158	Montana	Gresham House, E.O.
New Guston .....S	3/4 3/4	3/4 3/4	1 0	1/- Oct. '92	1 0 0	110,000	Colorado	25A, Old Broad-st.
Palmarajo .....GS	1/3 1/9	1/8 1/	1 0	—	1 0 0	415,998	Mexico ...	32, Old Jewry, E.O.
Pinos Altos (D) GS	3/4 3/4	3/4 3/4	1 0	-6 Mar. '90	1 0 0	100,000	"	110, Cannon-street.
Richmond .....GS	3/4 3/4	3/4 3/4	5 0	1/- Dec. 16 '95	5 0 0	54,000	Nevada ...	44, Coleman-street.
St. George.....	1/ 2/	1/ 2/	5/	—	0 4 9	—	G O'gla USA	8, Geo Ho., E'cheap
Sierra Buttes ...G	3/4 3/4	3/4 3/4	2 0	-8 Oct. 30 '95	2 0 0	122,500	California	139, Lendenhall-st.
" Pumas Eur. G	3/4 3/4	3/4 3/4	2 0	-9 Oct. 30 '95	2 0 0	140,265	"	"
Springdale.....G	1/- 1/8	1/ 1/8	1 0	-2 Sep. 28, 9	\$1	1,000,000	Colorado	20, Abchurch Lane.
Twin Lake Placers	1 1 1/2	1 1 1/2	0	3/- Feb. '95	1 0 0	26,000	"	6, Lawrence P. H. E
SOUTH AND CENTRAL AMERICAN MINES.								
Anglo-Chilian PtN	9 1/2	9 1/2	10 0	13/11-5 Jun '95	10 0 0	35,000	Antofagat.	123, Bishops.-st. W.
" 6% RyistMB	104 106	104 106	100 0	6 1/2 Jan 2 '96	100 0 0	220,000	S. Litis ...	3 & 5, Queen Street.
Argen. Concessions	1/9 2/3	1/9 2/3	2/	—	0 2 0	150,000	"	"
Caratal.....G	1/9 1/3	-6/ 1/	2/8	—	0 2 6	1,330,000	Venezuela	57, Moorgate-st. E.O.
Caylloma.....S	-6/8 1/	-6/8 1/	5/	1/- Apr. '94	2 0 0	125,000	Peru .....	52, Leadenhall street
Colon.....G	1/8 1/2	1/8 1/2	5 0	2/8 Dec. 16, '95	0 4 0	200,000	Colombia	5, Copthall-bdgs. E.O.
Colorado Nit. ....N	1 1/2	1 1/2	20 0	10 Dec. Aug. '94	20 0 0	32,000	Chili .....	12, King-st., Liver'p
Colombia.....G	1 1/2	1 1/2	1 0	1/- 26 Feb. '95	1 0 0	75,000	Venezuela	Ciudad Bolivar.
Colombian Hy.....G	1 1/2	1 1/2	1 0	2/6 Dec. 10 '95	2 0 0	100,000	Colombia	10, Blomfield-street
Copialpo.....C	1 1/2	1 1/2	1 0	—	2 0 0	100,000	Chili .....	Dashwood House, E.O.
Darien "A".....G	4 1/2	4 1/2	1 0	—	1 0 0	49,553	Colombia	Manchester.
" B.....G	6 1/2	6 1/2	1 0	—	1 0 0	30,000	"	"
Don Pedro.....G	7/8 1/3	7/8 1/3	1 0	—	1 0 0	133,102	Brasil.....	24-5, Devonsh. Cs E.O.
El Callao.....G	3/4 3/4	3/4 3/4	5 0	9 1/2 Feb. '94	1 0 0	257,600	Venezuela	8, Bishopgate-st. Wn
Frontiuz & B...G	1 1/2	1 1/2	1 0	1d. Jan. 18 '96	1 0 0	185,562	Colombia	14, Gresham House
Glenrock.....G	1/8 2/3	1/8 2/3	1 0	—	1 0 0	199,848	Arg. (Atl.)	2-5, Queen-street, E.O.
Gravel.....G	2/3 3/8	2/3 3/8	1 0	—	1 0 0	150,000	Colombia	10, Blomfield-street
Guadalupe.....GS	3/8 5/8	3/8 5/8	1 0	—	1 0 0	130,000	Honduras	1A, Union ct. Old Bld
Julia Talita .....N	3/4 3/4	3/4 3/4	1 0	—	1 0 0	105,234	Nicaragua	139, Cannon-street.
Lagunas.....N	3/4 3/4	3/4 3/4	5 0	15p.c. Dec. '94	5 0 0	120,000	Tarapaca	3, Gracechurch st;
Lautao.....N	6 1/2	6 1/2	5 0	5/- Dec. 30 '95	5 0 0	110,000	Chili .....	70, "
Liverpool.....N	8 1/2	8 1/2	5 0	15/- Dec. 16, '95	5 0 0	22,000	Colombia	3, Gracechurch-st.
Loma.....G	-7/8 1/2	-7/8 1/2	5 0	3/4 Nov. '89	1 0 0	300,000	Chili .....	5, Copthall-building
London Nit.....G	1 1/2	1 1/2	5 0	3/4 Nov. '89	5 0 0	10,000	Chili .....	9, Gracechurch-st.
" Nit.(Prof.).....	3 1/2	3 1/2	5 0	8 1/2 Nov. 28 '95	5 0 0	22,000	"	"
Macate.....G	1/8 2/3	2/- 2/6	2/	—	0 2 0	200,000	Peru .....	11, Old Broad-st. E.O.
New Tamarugal N	3/4 3/4	3/4 3/4	1 10	1s. Dec. '94	1 10 0	130,000	Tarapaca	50, Lime-street, E.O.
" 5% Cum Pref	7 1/2	7 1/2	1 10	8 p.c. Feb. '95	1 10 0	130,000	"	"
" 8 p.c. Debs ...	7 1/2	7 1/2	100 0	6 p.c. Feb. '96	100 0 0	4260,000	"	"
Orita.....G	1/3 1/9	1/3 1/9	1 0	1/- April '99	1 0 0	30,000	Colombia	10, Blomfield-street
Ouro Preto.....G	—	—	1 0	1/- Feb. '93	1 0 0	80,000	Brasil....	6, Queen-street-place
Pao. & Jaspampa N	1 1/2	1 1/2	5 0	4/- May. '95	5 0 0	72,000	Tarapaca	3, Gracechurch-st.
Phoenix.....G	-3/9 1/2	1/- 1/3	10/-	—	0 8 0	400,000	S. Luis ...	3 & 5, Queen Street.
Primitiva.....N	—	—	5 0	40 1/2 Oct. '89	5 0 0	40,000	Venezuela	Liverpool.
Quebrada.....C	3/4 3/4	3/4 3/4	3 0	5 1/2 Mar. '92	3 0 0	241,358	Venezuela	38, Nicholas Lane.
Rosario.....N	5 5 1/2	5 5 1/2	5 0	5/- Feb. 13 '98	5 0 0	110,000	Chili ...	57 1/2, Old Broad-stre
" (5 1/2 Deb.)	104 107	104 107	100 0	5 1/2 Oct. '95	100 0 0	475,000	"	"
" Hu' Dh Serp	103 105	103 116	100 0	5 1/2 Jan. 2 '96	100 0 0	4200,000	"	"
St. John del Rey G	1 1/2	1 1/2	5 0	1/2 Nov 19 '90	1 0 0	327,850	Brasil.....	Finsby Ho., Blm'd st
San Donato .....N	1 1/2	1 1/2	5 0	2/6 May 24 '95	5 0 0	32,000	Chili .....	12, King-st., Liverp
" Jorge.....N	5 1/2	5 1/2	5 0	5/ Oct. 16 '95	5 0 0	32,000	"	9, Gracechurch-st.
" Pablo.....N	2 1/2	2 1/2	5 0	5/ Oct. 30 '95	5 0 0	32,000	"	"
" Sebastian ...N	1 1/2	1 1/2	5 0	5/ May 24 '95	5 0 0	29,000	"	Dashwood House E.O.
" Santa Barbara ..N	3 1/2	3 1/2	5 0	1/3 Dec. '86	0 10 0	60,000	Brasil.....	Liverpool
" Elena.....N	3 1/2	3 1/2	5 0	5/- Nov. 15 '91	5 0 0	22,000	Tarapaca	3, Gracechurch-st.
" Rita.....N	3 1/2	3 1/2	5 0	10/ May 24 '95	5 0 0	80,000	Chili .....	Dashwood House, E.O.
Segovia.....G	—	—	5/-	—	5 0 0	120,000	Colombia	5, Copthall-building
Tollima "A".....S	6 6 1/2	6 6 1/2	5 0	10/- Jy 11, '95	5 0 0	14,000	"	18, Finsbury-circus.
" " B.....S	4 1/2 5	4 1/2 5	5 0	10/- Jy 11, '95	5 0 0	6,000	"	"
INDIAN AND ASIATIC MINES.								
Balaghat Mysore G	3/3 3/9	2/6 3/	1 0	—	0 19 0	159,945	India .....	6-7, Queen-street-pl
Burma Ruby.....H	7 1/2	7 1/2	1 0	—	0 18 0	299,551	Burmah...	Suifolk House E C
Champion Reef...G	5 1/2	5 1/2	1 0	5/- Jan. 18 '98	1 0 0	220,000	India .....	6-7, Queen-street-pl
Colar Central ...G	1/- 1/8	1/ 1/8	1 0	—	0 19 0	200,000	Dashwood Ho., E.O.	"
Cordofana.....G	2 1/2	2 1/2	1 0	—	0 17 6	85,000	"	6-7, Queen-st-place
Gold Fields Mysore G	21/8 22/4	20/- 21/	1 0	2/- Feb. '96	1 0 0	275,000	"	6-7, Queen-street-pl
Kadur Mysore....	4/ 5/	4/ 5/	5/	—	0 5 0	400,000	Copthall House, E.	"
Kempinkote GdF	2/ 2/6	2/ 2/6	5/	—	0 3 8	750,000	India .....	6-7, Queen-st-place
Mysore.....G	4 1/2	4 1/2	1 0	2/ Oct. 30 '95	1 0 0	248,354	"	6-7, Queen-street pl
" My. Harballi ...G	1/- 1/8	1/ 1/8	1 0	—	0 18 0	100,007	"	21, East India Avenue
" Reets.....G	9/- 10/	8/ 9/	1 0	—	1 0 0	160,000	"	6-7, Queen-street-pl
" West(R)G	1 1/2	1 1/2	1 0	—	0 19 0	127,402	"	2, St. Winchester S
" Wynnad.....G	1 1/2	1 1/2	1 0	—	0 19 0	185,000	"	"
" Nine Reefs.....G	2/9 3/2	1/8 2/3	10/-	—	0 19 0	250,000	"	6-7, Queen-street-pl
" Wundyrrood...G	3 1/2	3 1/2	1 0	1/8 Nov 14 '95	1 0 0	300,000	"	"
" Ooregum (Df.O.)G	3 1/2	3 1/2	1 0	3/- Dec. 16 '95	1 0 0	145,000	"	"
" (10% Pref.)...	3 1/2	3 1/2	1 0	3/- Dec. 16 '95	1 0 0	107,011	"	"
" (10% Pref.)...	3 1/2	3 1/2	1 0	2/- Dec. 16 '95	0 8 0	15,389	"	"
" Pauang Ashang T	1 1/2	1 1/2	1 0	—	1 0 0	200,000	Malay Pn.	4a, Jeffrey's st. E.
Yerrakonda.....G	1/8 1/8	1/8 1/8	4/	—	1 2 6	187,491	Mysore ...	6-7, Queen-street-pl



## THE USEFUL MINERALS OF TASMANIA.\*

By A. MONTGOMERY, M.A.

(Concluded from page 155.)

## Lead.

All the lead ores in the country carry more or less silver, and are worked more for this than for the lead, they may be considered silver ores; and the above account explains all that it is now necessary to say about their distribution and mode of occurrence.

## Zinc.

The zinc ores associated with the silver and lead likewise require no special mention. Blende is the compound usually present. It is generally poor in silver, but has, in a few cases, been worth metallurgical treatment for its argentiferous contents. Some of it at the Whyte River is said to contain cadmium.

## Copper.

Native copper and oxide of copper occur in the streams near Mount Lyell in places, and as crystals in the surface soil. They are evidently formed by the reduction by the organic matter of the soil of cupreous solutions emanating from the copper-bearing pyrites common in the district. A little native copper is sometimes found in the Mount Bischoff Mine, usually in crevices where it has probably been formed by reduction of copper sulphate. Copper pyrites is common throughout the country in small quantities, in the auriferous lodes and in those carrying galena, also at times in the tin lodes and stock-works. At Saxon's Creek, near Frankford, it occurs of great purity in irregular quartz veins, which can hardly be called true lodes. Fahl ore is found in a lode at North Dundas, and in small quantity in the Zeehan silver lead lodes. The arsenical variety (tonnantite) is also found at Mount Lyell, in the rich secondary vein in the Mount Lyell Mine, associated with bornite, stromeyerite, and chalcocypite. The great hope of Tasmania becoming a copper-producing country lies in the deposits of cupreous pyrites along the West Coast copper-bearing belt, which appears to stretch from Mount Lyell, through Lake Dora, Mount Reid, Mount Murchison, and the Rocky River, right on to the Savage River. Some of these may be indigenous deposits, but others are either xenogenous from the beginning, or else have been altered a good deal by subsequent chemical reactions. Being as yet but little opened up, there is not much certainty as to the modes of occurrence. The pyrites is not, as a rule, rich in copper, being usually a cupriferous iron pyrites, rather than a chalcocypite.

## Nickel.

In the Dundas field a deposit of pyrites containing copper and nickel has been lately opened up, but I have no reliable information as to the nature of the occurrence.† At Heazlewood, in the serpentine country, there are veins of pentlandite and zarite, which seem to be irregular in size and shape, and probably belong to a class of segregated veins rather than to true fissure deposits.

## Cobalt.

Cobaltiferous oxide of manganese (asbolite) is not uncommon, and is found in considerable quantities at Derby tin mines, forming the material cementing together the drift sand into a hard black grit or conglomerate. The percentage of cobalt in this cementing material is considerable, and it might be payable to work if some mechanical means could be devised of separating out the sand from it at a very cheap rate.

## Bismuth.

A little native bismuth is seen at times in the lodes in granite country at the Blue Tier. In the New Moon Company's property it is found in small specks in vitreous white quartz without other metals associated, and in the Lottah lode it is associated with tin ore, wolfram, molybdenite, and talc. Recently a large waterworn nugget of native bismuth, 55 lbs. in weight, which must be one of the very largest lumps ever found of this metal, was obtained near Woldborough by a party working for alluvial tin, but further search has not led to the discovery of more of it. At Bell Mount bismuth occurs in considerable quantities in smallish lodes, with cassiterite, topaz, and quartz, in Silurian sandstone country. At surface it is in the form of carbonate from oxidation, but lower down sulphide of bismuth and the metal itself have been obtained. This occurrence of cassiterite and bismuth together is, to the best of my knowledge, unusual. At Mount Ramsay native bismuth is found disseminated through a mass of hornblende rock, which occurs as a contact lens between granite and a dioritic rock (serpentine?). It is associated with fluorite, scheelite, axinite, pyrrhotite, chalcocypite, arsenopyrite, and pyrites. At North Mount Reid native bismuth and sulphide of bismuth occur with quartz, fluorspar, copper, and iron pyrites, &c., in a lode.

## Mercury.

Both native mercury and cinnabar are reported to have been found in the Mount Lyell district, but I have no further information as to the nature of the deposit.

## Antimony.

Stibnite has been found in some quantity in the old Wanderer lode at Lefroy, and in small amounts in the auriferous reefs of the same district generally, but nowhere in commercial quantity. A little native antimony has been found in lode matter consisting of quartz and sulphides, from the Hay's P.A., at Whyte River. The occurrence of fahl ore has already been noticed under copper. Jamesonite has likewise been found at Waratah and Dundas.

## Arsenic.

Arsenopyrite occurs pretty plentifully in some of our auriferous reefs, especially in the Waterhouse and Upper Scamander districts; also with tin deposits at Blue Tier, Mount Bischoff, and North Dundas. It is also found at times with the silver-lead ores of North Dundas, and occasionally is rich in silver. Arsenic also occurs in the arsenical fahl ore of Mount Lyell.

## Platinum and Allied Metals.

In the alluvial drifts of the West Coast, particularly along the Savage River, a good deal of platinum and iridium are obtained, probably derived from the serpentine country. Platinum itself is said to have been found at the Wilson River. Osmiridium containing, however, very little osmium, is said to be found at parts of the King River gold field, and at the Salisbury field, near Beaconfield. None of these metals have yet been found in the original matrix.

## Iron.

Tasmania is well provided with ores of iron, some of which, sooner or later, will be worked on a commercial scale. I have no information as to the several occurrences of hematite near Lindillon on the East Coast, at Marsden's Hill, York Rivulet, Penguin Creek, and Mount Donaldson, mentioned by Mr. R. M. Johnston, in the *Tasmanian Official Record*, and shall mention

tion only such as I have personally examined. Bog iron ore, more or less impure, is common all over the country; it is often used for road-making, and sometimes for the manufacture of hematite paint. Near Ilfracombe a manufactory was at work for some time making paint from a deposit of magnetite and limonite, and a good deal of the soft limonite was shipped to Melbourne for gas purification. In this vicinity there are very large deposits of magnetite, which seem to be derived from the adjacent serpentine formation; they are, most probably, chemical concentrations of the iron from the serpentine during its slow decay by weathering. This ore contains a few units per cent. of chromium, which caused the failure of a large iron works established some years back to work it, as at that time iron containing chromium found no market. In the same district there is a considerable deposit of brown iron ore quite free from chromium and otherwise very pure, but its mode of occurrence is not clearly visible. At the Blythe River there is an enormous deposit of red hematite in lower Silurian strata; the ore is of excellent quality, well fitted for the Bessemer process, and in unlimited quantity. It seems most probable that this deposit is indigenous rather than xenogenous, having been originally a mass of brown iron ore which has been enclosed in the country strata during their formation. At the west side of the Zeehan field there are some large deposits of magnetite, which, probably, are in some way connected with the neighbouring serpentine formation, but have not been opened up so as to make their nature clear. On the silver fields many of the lodes have very large caps of gossan, mostly brown oxide of iron and oxide of manganese, which, though probably never pure enough for ores of metallic iron, will serve admirably for iron flux in lead smelting operations.

## Manganese.

Though oxide of manganese is very common in many parts of the country it has nowhere been found in quantity of sufficient purity to be worth raising for export.

## Tin.

Our deposits of tin are both hystermorphous and xenogenous, while it is possible, also, that it exists at times as an original constituent of the granite rock, in which case it would be indigenous. The ore is practically confined to the granite regions and their immediate vicinity. The alluvial deposits require no very special description; they are of all ages, from early Tertiary to recent, and are distributed through gravels occurring in deep leads, terraces, and recent drifts. The deep leads of the Derby district are notable for the great depth of their deposits of stanniferous drift, the wash-dirt being frequently as much as 100 feet in thickness. These drifts were formed during the long period of subsidence in early Tertiary times, during which the rivers gradually filled up their valleys instead of eroding them deeper.

On some of the granite mountains, such as Mount Cameron and the Blue Tier, it has often been noted with surprise that while almost every small watercourse contained alluvial tin ore, in very few of them were any lodes found capable of supplying the ore. This has led to a belief which seems well founded, that the granite itself contains a little tin ore all through it.

The xenogenous tin deposits deserve more detailed description. They may be divided into—(i) fissure lodes, and (ii) stockworks and impregnations. These classes are not always distinguishable, as some of the lodes have stockwork-like masses connected with them. True lodes are found in the Blue Tier, Ben Lomond, St. Paul's River, Mount Bischoff, Bell Mount, Heamskirk, and North Dundas districts, usually in granite country, but sometimes in the Silurian formation. The Lottah lode at the Blue Tier usually consists of a central body of quartz carrying a little tin ore flanked by granitic-looking lodestuff, composed of quartz and silvery mica, with much talc, and often very rich in cassiterite, with sometimes molybdenite. At times there is much felspar in this lodestuff, and the materials are arranged in a banded manner, but generally this portion of the lode appears not "crustified," and seems more like the granite wall rock altered by removal and substitution of some of its constituents than a deposit in a fissure. The clean white quartz is no doubt a fissure deposit, but it seems likely that the greisen-like matter on the walls of it is only the wall rock partially altered by metamorphic change from the influence of the solutions which once traversed the fissure. The tin ore is deposited especially on the contact of the granitic lode matter with the quartz, as if on the original fissure wall. The line of division between the lode matter and the unaltered granite is not well marked, and sometimes the lodestuff merges imperceptibly into the wall rock, a fact which gives much support to the above explanation of the origin of the greisen-like material. The Cambria, Crystal, and New Moon lodes are very similar, but have not the central quartz streak so well defined as in the Lottah. The principal part of the lodestuff, however, appears to be wall rock, altered by the infiltration of the lode solutions. The Brookstead lodes at the St. Paul's River field likewise show the same sort of thing; in some the central streak of the lode is remarkably rich in tin ore mixed with quartz fluorspar. All the above lodes are very straight and even, closely resembling the main joints which traverse the granite, and it is not improbable that the lode fissures were first of all joint planes. At the Great Republic Mine at Ben Lomond, two or three contiguous fissures in the granite seemed to have formed a passage way for lode-making solutions. Usually they are very narrow and contain a mere thread of quartz between two hard granite walls, but at a point where two of them intersect a wider vein results. This is, however, quite small, not usually more than 2 inches in width, and is often filled with nearly pure fluorspar, at other parts with fluorspar and quartz. Along this intersection a vertical pipe of ore has been formed, which towards surface, however, runs off at an angle from the vertical following one of the veins. The deposit is very short, averaging, perhaps, some 20 feet in length along the veins, but extends into the walls some 5 or 6 feet on each side. The granite is softened, the felspar and mica converted into clayey and chloritic matter, and the whole mass impregnated richly with cassiterite. At times it is very full of globular bundles of radiating black tourmaline crystals. The altered rock merges imperceptibly into the wall granite, and to my mind it is quite clear that the deposit owes its origin to the lode solutions penetrating and altering the country rock. This ore mass would then be more of the nature of a stockwork on a small scale than of a fissure deposit. In the same district there have been from time to time found very rich bunches of tin ore similarly connected with insignificant-looking veins, and probably formed in the same way as the above. At Storey's Creek, Ben Lomond, lodes of quartz carrying tin ore and wolfram are found in Silurian strata close to the granite country. The quartz is white and vitreous and the tin ore is in large well-formed crystals, yielding excellent cabinet specimens, though very poor on the whole. The difference in the general appearance of the lodestuff from that of the lodes in the adjacent granite is very marked. In the latter it is granular quartz much mixed with silvery mica and talc, and carrying the cassiterite in minute crystalline grains, often aggregated into bunches, together with some fluorspar and tourmaline. At Bell Mount the tin lodes run through Silurian sandstones. The lodestuff is quartz, frequently with a little mica, or hydromica through it, with topaz, cassiterite, and bismuth ores. At Mount Bischoff

the lodes also traverse Silurian rocks, but are very closely connected with a dyke of eufuite and topaz porphyry, which has formed tin deposits of more than one type. The porphyry itself, especially the topaz porphyry, often carries tin ore, which may be indigenous in it, and in its immediate vicinity the joints of the Silurian rock are often faced with cassiterite crystals. Where the lodes are small, and traverse some distance into the Silurian country away from the dyke, the filling is mostly quartz and talc, with a good deal of fluorspar, the metallic minerals being cassiterite, pyrrhotite, pyrites of iron and copper, and arsenical pyrites. At times the cassiterite is nearly free of sulphides; at others it is impregnated through a dense mass of them, and requires roasting treatment before it can be separated. The great deposit of the Brown Face appears to be a huge contact mass between the porphyry and the Silurian rock. It is composed of oxide of iron, with not much quartz in it, and with cassiterite more or less all through it. Large lumps of tin ore are often found consisting of aggregates of minute black crystals, large sized crystals such as are found in the East Coast tin-fields being very uncommon. The gossan is most probably the result of the decomposition of a large mass of pyrites similar to that found in the small lodes. Not long ago a quantity of native sulphur was found in it, intermixed with sintery quartz (gayerite), but I am inclined to refer this to the decomposition of the sulphide, and not to hot spring action.

On the surface the Mount Bischoff deposit consisted very largely of alluvial matter derived from the underlying lodestuff, the heavy tin ore having remained almost on the spot whence it was set free, while the lighter rocky matter was removed. The occurrence of tin at Bischoff is, therefore, unusual, as presenting almost all the known types; alluvial ore, ore in lodes, ore in ramifying small veins through country rock, in a contact mass, and impregnated through the intrusive porphyry. It seems probable that the original tin-bearing rock was the porphyry; and when it was thrust into the Silurian strata it fractured them, and afforded spaces for the circulation of hot solutions carrying tin and other metals which were there deposited.

At North Dundas there is a very similar deposit, which has not yet been much opened up, however. Tin ore, very much like that of Mount Bischoff in appearance, is found with the same sulphides as at Mount Bischoff, in veins of Silurian rock in the vicinity of a similar dyke of quartz porphyry.

At Mount Heamskirk the lodestuff is mostly quartz and tourmaline, sometimes almost entirely the latter, and the tin ore is generally in minute crystals. The country is granite, but neither the ore nor the lodestuff closely resembles those of the East Coast tin fields.

The stockworks and impregnated deposits of tin ore are best seen at the Blue Tier. Here there are numerous tin-bearing masses of great size, which will in time be a source of much wealth to the colony. The ore is finely disseminated through dykes of quartz-porphry which have penetrated the main granite; this quartz-porphry is, however, a very variable rock, containing both mica and felspar at times, and no name properly suits it in all its varieties. The tin-bearing rock is composed of fine quartz granules set in a felspathic matrix as a rule, but sometimes with much mica; the felspar is much weathered at surface. Numerous small veins are often seen in the mass, and at times there are larger ones which may be termed small lodes; these generally have granitic lodestuff (greisen) in them similar to that found on the walls of the true lodes of the same district previously mentioned. The rock seems to have suffered a certain amount of internal chemical alteration, analogous to that which a gabbro changes to serpentine, in the tin-bearing portions. The tin ore is disseminated through the rock and is not confined to the joints, indeed the minute veining with strings of ore usually mentioned as the characteristic feature of stockworks is hardly perceptible in these bodies. Some of them have been worked as open quarries for tin ore with more or less success.

At Gladstone, in the Fly-by-Night claim, at Roy's Hill and at Bell Mount, there are stockworks of tin ore at the junction of the granite country with the Silurian formation. It would appear probable that hydrothermal action took place along the contact, and resulted in the alteration of portion of the granite and the impregnating of it with cassiterite. In the Bell Mount mass there is a great deal of topaz in nests and bunches closely associated with the tin. The composition of the contact stockworks just mentioned is quite like that of those of the Blue Tier, which are probably the result of hydrothermal action along the quartz-porphry dykes, if, indeed, it does not prove that these are only altered portions of the main granite which simulate dykes.

The Rex Hill lode is difficult to class: it is a very wide body of granitic lodestuff in hard grey porphyritic granite, the country being often separated from the lode matter by a well-defined selvage. There is a vein of quartz towards the centre of the mass, but it is rather irregular, and appears connected with the second filling of the lode with galena and other sulphides mentioned above under silver, rather than with the original tin-bearing stuff. The lode matter is similar to that forming the sides of the Brookstead and Blue Tier lodes, altered granite, but quite similar stuff is often seen in the stockworks. There is no distinct fissure, and the lode matter appears to be altered country rather than a precipitate in a fissure. Tin ore occurs freely throughout the mass. The classification of this body as a true lode or as a stockwork will have to be deferred till it has been further opened up.

## Wolfram.

This mineral occurs in the granite districts, but not usually to such an extent as to affect the value of the tin ore. At Storey's Creek, Ben Lomond, and at the Iris claim at Bell Mount there is a good deal of it with the tin. At the Interview River, Ben Lomond, and Great Russell Rose River gold samples of wolfram have been obtained in lodes of quartz, and a little mining work has been done.

## Molybdenum.

Molybdenite is pretty common at the Blue Tier, in the tin lodes and stockworks, but it is not saved in the mining.

## Non-metalliferous Minerals.

In the earlier part of this paper, as much mention as is necessary was made of the building-stones, fire-clays, onches, gneisses, and other non-metalliferous minerals of Tasmania. The principal one is coal, the geological position of which has already been described. In the upper measures there are usually several seams in the coal-bearing horizon, but in the lower series the occurrence of coal is not repeated more than once or twice. The coals are free-burning, and vary from highly bituminous to somewhat anthracitic; only few of them form a coke, and almost all have more ash than is desirable, though forming good useful fuels. A bed of very fine coal exists at Barn Bluff in the lower measures, but it is very difficult of access. In the Tertiary beds of the Esk and Derwent basins lignite is not uncommon, sometimes burning very well on account of containing much resin. Graphite of good quality is reported to occur at Barrow Island.

\* Paper read before the Australian L.M.S., Hobart meeting.

† A recent examination shows that the deposit is one of cupriferous and nickeliferous pyrites at the junction of Silurian with serpentine country.



## SIDE LIGHTS ON THE LAW:

Legal Jottings on Cases in the Courts, and on Questions affecting Mining, Railway, Financial, Industrial, and allied Interests.

BY A BARRISTER.

LIGHTERMEN should know what is their duty with regard to taking delivery of a cargo from alongside the ship under the terms of an ordinary Charter-party. In a case which is now reported in the recognised reports, a ship was chartered to carry a cargo of spars to docks in the Port of London. By the terms of the Charter-party the ship was to discharge "overside in the river or dock into lighters." Following the ordinary practice, the lighters sent to take delivery had only two men each in them. The shipowner considered that he had performed his duty as to discharging the cargo when he had put the spars over the side of the vessel on to the lighter, and that it was no part of his duty to assist the lightermen in receiving the spars and arranging them upon the lighters. The consequence was that the operation of discharging the cargo occupied a greater number of days than allowed by the terms of the Charter-party for the ship to be delayed in the docks for that purpose, and consequently the shipowner claimed damages for demurrage against the Charterers. It is now settled by the Court that the words requiring cargo to be discharged by the shipowner into lighters does not require him to do more than hand it down to the lighters, and it is the duty of the lightermen to receive the cargo with men sufficient in number to take delivery within the time provided.

To give a business interpretation to a business Act of Parliament is business. By an Act of Parliament of 1872, which expires in 1902, a duty of  $\frac{1}{4}$  of a penny per hundredweight is granted to the Corporation of London upon all grain brought into the Port of London for sale. The Corporation claimed that they were entitled to this duty upon all grain brought in whether or not it was to be sold as grain, and that grain brought in for sale in the Act of Parliament was in contradistinction to grain brought in for consumption. Some dealers, who were also millers, brought grain consisting of maize and oats into the Port of London; this grain they subsequently crushed and sold the meal and the residue separately. They, therefore, did not sell the grain as grain, but first changed it into something else, in which form they sold it. The Court holds that an ordinary business meaning is to be given to a phrase in a business Act of Parliament. That as the sale intended by the millers could in no sense be a compliance with a contract for the sale of grain, the grain was not brought in for sale. That it could be brought in for three purposes—for sale, for consumption, and for manufacture. It was, therefore, grain brought in for manufacture and not for sale.

The layman, and sometimes the lawyer, is troubled to know whether, in taking another security, he is giving up his original right. This often arises from a confusion of what is known as the doctrine of merger (which is an operation of law) with facts which constitute an agreement between the parties. For instance, to illustrate what I am saying, if a man owes you a debt, secured or not by a promissory note or bill of exchange, and you take a mortgage or other security by deed containing a covenant to pay the amount of the debt, in the absence of any agreement that this is only to operate by way of collateral security, the debt is said to be merged in the covenant to pay; that is to say, the higher and more solemn right, as it is called, of a deed takes the place of the simple contract debt. If, however, any tenant owes me rent, or I have a judgment against anyone (since a judgment debt stands on the same footing as rent), and I take a promissory note, payable at a certain time, from him for the amount, it does not necessarily follow that I have agreed to suspend my remedy to distrain for rent or issue execution on the judgment against him for that period. That may be the inference, but it is not necessarily so, for it may only have been taken as a collateral security. It, therefore, depends upon what has taken place between us, and the taking of such a note is only *prima facie* evidence that I have agreed to suspend it, but is not conclusive.

It does not do to lay down in your mind with certainty either that your wife is or is not your agent. If you do one or the other you are likely, sooner or later, to be disillusioned. A short time since a man who had, with too free a hand, paid his wife's millinery account found that by so doing he had held out his wife his agent to pledge his credit to no inconsiderable amount. Now comes an illustration from the humbler sphere of the working man who, when thirsty, assumed too readily that his wife was his agent, and would generally and necessarily be so considered, when commissioned by him to fetch his beer. The working man was the member of a club at Saffron Walden, and one Sunday sent his wife for the Sunday beer to the club provided with money. The steward sold her the beer, and was subsequently prosecuted and convicted before the local bench of justices for selling beer by retail without a licence. The steward appealed, depending upon a case of "Graff v. Evans," which since 1882 has been regarded by working men's clubs as a kind of charter, by which privileges are, if not accorded, at least secured to them, which at one time were supposed to be the right of their more aristocratic neighbours. That case laid it down as law, and it has not since been questioned, that if the goods and provisions of a club are the property of the members or subscribers (as distinguished from a proprietary club), and a member obtained liquor there, the transaction by which he obtained and paid for it was not a "sale" by retail within the meaning of the Licensing Act, 1872. The judges, however, have upheld the Saffron Walden justices, as the wife was not shown to have been the agent of the husband, and had not purchased the beer under and in accordance with the rules of the club, which only contemplated members obtaining beer there, and did not allow of sales to the agents of members. From this it may be gathered that although in law a contract with an agent is a contract with the principal, yet if a husband wishes beer from his club he had better fetch it himself, otherwise he may be under the painful necessity of convincing a bench of magistrates that his wife was his duly authorised agent.

The Factory Act, 1878, Section 9, says: "A child shall not be allowed to clean any part of the machinery in a factory while the same is in motion." Does the word "same" refer to "part" or to "machinery"? This question came before Lord Justices Lindley and Kay on Wednesday, and they held that it said and meant that a child shall not be allowed to clean any part of the machinery while the machinery was in motion. In the case in which the point was raised, a child of eleven had been employed in a cotton spinning factory in Lancashire to clean the front part of the roller beam of a machine called a spinning mule,

while the machine itself was running. The roller beam is a fixed part of the machine. The employment was not dangerous, and the child was not injured. But this makes no difference so far as compliance with the Act is concerned, the object of which is, said the Lords Justices, to keep children clear of moving machinery.

## MINING IN CORNWALL AND DEVON:

### NOTES ON MINING IN THE WEST.

(FROM OUR SPECIAL CORRESPONDENT.)

It is difficult to know precisely what to say of Cornish mining at this particular moment. We do not desire to take too gloomy a view of the present most unfortunate position, and, at the same time, it is difficult to take anything like an optimistic view. There is no doubt about this fact, that there is really no sound reason why the industry should be in the sad plight in which it finds itself at this moment, and, but for a combination of circumstances—most of them preventable—it would not have been. It is not far to seek the causes. Certain exactions are made by a mining lord; these exactions are so much resented by one large shareholder—among others—that he relinquishes his holdings in mines which do not pay, and, as a result, these mines which do not pay are shut up. We do not mean to say that the price of tin has not had something to do with it, but it is evident to anyone who takes an intelligent interest in the industry that such a mine as West Frances, for instance, would not have closed but for the relinquishment of Mr. Williams's shares. Therefore, it is obvious that the cause of Mr. Williams's relinquishment is the cause of the shutting up of this particular mine. We understand that the Tehidy office show not the slightest sign of relenting in their intention to force their claim on South Frances for damaged land. The claim will not, however, be paid as it stands, except through a Court of law, and we doubt whether Mr. Basset will go so far as that. The committee are determined not to give in, and they are strong enough to fight Mr. Basset if the worst comes to the worst. The policy of Tehidy is utterly inexplicable. Here is a district going to rack and ruin about as fast as it can go, and the lord of the mine is also, of course, interested in the property at surface, and yet the property at the surface is being sacrificed for the sake of a few thousands of pounds. Who is likely to take property in Camborne or its vicinity just now? It does seem very much like killing the goose that lays the golden eggs. But we suppose Mr. Basset knows his own business best. All we are concerned in is the mining industry of the county, and unless something unexpected turns up it looks as though that industry must be so crippled that even under the best of conditions there can be no revival of the good old palmy days. This is not, as we have pointed out before, from any lack of mineral, because that is practically inexhaustible, but because people who have money do not care to invest in properties where there is the chance of any interference from the owner of the royalties. We hear hints of some Parliamentary action, and with such representatives of Cornish mining as Mr. Bolitho, M.P., and Mr. Strauss, M.P., who would carry with them the whole of the Cornish members, it ought to be fairly easy to bring such pressure as would result in the establishment of a Court of Arbitration between the lords and the mine shareholders, and between two sets of shareholders who may be at variance with one another.

The closing of West Frances is another serious blow, but it was only to be expected that the continuing shareholders would not allow those who had deserted them to leave without paying their full share of the liabilities. West Frances has, however, always been regarded as one of the best properties, and its returns of tin have shown that it is in a good tin district and on productive lodes; we shall be surprised, therefore, if it remains unworked. West Frances shareholders, if they do not care to rework, might dispose of the property with the consent of the lords to the adjoining companies of Wheal Grenville and the Basset Mines (Limited), neither of which we should imagine would object to paying something for the machinery, and for the addition of ground which is doubtless valuable to each of those companies.

The absence of any information respecting Carn Brea and Tincroft is ominous, and the adventures when they meet on Tuesday will, we fear, have to face a serious condition of affairs. At Carn Brea there will be a call of from 20s. to 25s., and it is doubtful whether the shareholders will go on except under some new arrangement. In any case, however, it is to be hoped that if operations underground are suspended the engines will be kept going.

The condition of the unemployed in Cornwall is attracting considerable attention, and it is obvious that with the recent discharges from the mines there must be great distress. Measures of relief are being devised, and the probability is that the Lord Lieutenant will convene a county meeting for the purpose of raising subscriptions. The scheme which finds general favour is that of assisted emigration, and it is thought that there ought to be plenty of scope for Cornish miners in the West Australian gold fields just now.

The East Pool-Wheal Agar dispute continues, though there are indications of a possible settlement. Mr. Strauss is working hard in the hope of securing an agreement to arbitrate, and, with that in view, has issued a circular letter to Agar shareholders, asking for an expression of opinion. East Pool, in spite of the presence of water in the bottom of the mine, was able to show a profit of £358, arsenic being again responsible for the profit.

THE INSTITUTION OF MINING AND METALLURGY.—The fifth ordinary meeting of the fifth session will be held on the evening of Wednesday, February 19, in the Lecture Theatre of the Geological Museum, Jermyn-street, S.W., at eight o'clock, when the following paper will be read:—"Mining in the Wolastonite Ore Deposits of the Santa Fé Mine, State of Chiapas, Mexico," by Mr. E. T. McCarthy (member).

We are requested to state that the arrangements are now complete for lighting in the evening the Southern Galleries of the South Kensington Museum on the west side of Exhibition-road, which contain the collections of machinery and naval models. These galleries will be open free to the public from February 17 on three evenings a week—Mondays, Tuesdays, and Saturdays, till 10 p.m.—in the same manner as the main buildings.

ERRATA In letter headed "Royal School of Mines," is issue of February 8. In lines 19, 51, 77, 99, dockyard for dockpond, a few Continental geologists for few Continental geologists, class of teaching for class teaching, that late professor for the late professor.

## MISCELLANEOUS MEETING.

### BRITISH GUIANA BANK.

The 118th half-yearly meeting of the proprietors was held on Tuesday, January 21, at the Bank, Georgetown, Demerara.—Mr. HUGH SPROSTON, jun. (the Chairman), presided.

The notice calling the meeting and the report of the directors having been read,

The CHAIRMAN said this was the second occasion on which he had the honour of addressing them, and he thought he could say, without fear of contradiction, that the report as submitted for the last half-year of 1895 was a satisfactory one. (Applause.) Considering the depressed state of the colony, and of the sugar properties, he thought they might congratulate themselves that day on the balance shown for the working of the past half-year, and he might say also for the half-year ending June 30. Both half-years had been highly satisfactory, taking everything into account. The volume of the business of the bank had been fairly well maintained during the period under review, and he hoped, when they met again in July, it would show even a better result than it did now. He considered the tide had turned, and the prosperity of the bank, he thought he might say, was assured. He was not going to hold out any hopes of a larger dividend next half-year, as it was the policy of the directors, himself included, that they should rather pay moderate dividends than high ones until they had wiped off a certain amount incurred on sugar properties in possession of the bank. Speaking in a business way, he did not consider that amount excessive. He did not intend to allude to the figures in particular, but he would call their attention to the fact that although the reserve fund stood at £60,000 sterling, the stocks as valued in November last were worth £20,000, so that they were now in a position to write up the reserve fund at £80,000 instead of £60,000, but the directors did not think it would be prudent to do so just at present. Speaking of the staple industry, "Sugar," planters had been fighting a hard battle for a long time, and they had maintained their position admirably. They had had very good weather during the past 12 months, and the crops had been good all over the colony, taking them on an average, and he thought he might also say a good many estates would show average profits on the working. The bank's sugar properties were now in a better position than they had been for some little time, and he did not think, with one exception, that the bank had, during the last half-year, lost any money on the sugar estates which actually belonged to the bank. The gold industry was not so flourishing as last year, but the small falling off was not serious. In all parts of the world the gold business fluctuated, and the small fluctuation there had been here during the last two or three years need not alarm them. He had heard by last mail of a matter which was a most important one to the colony at large. He referred to the boundary question, which had affected the colony considerably more than they in the colony were aware of. Parties who would have invested funds in sugar and other properties here were afraid to do so while the contention on the Venezuelan matter continued. He mentioned this because he got it from a very reliable source, and he thought the inhabitants generally, and the Government in particular, should do all they could to get the matter settled as soon as possible. What they wanted was a strong Government. At the present moment they had a very strong Government, and he only hoped it would continue. With a strong Government here, and a man like Mr. Chamberlain on their side, he hoped to see before the year was out the boundary question finally settled. He wished the proprietors to fairly understand that the labours of the directors, on behalf of the institution, had been more than ordinarily arduous during the past year, and for himself and his co-directors, and he thought he might say for all the shareholders, they had to thank their manager, Mr. Lane, to a great extent, for the present position of the affairs of the bank. (Applause.) He then formally moved the adoption of the report.

Dr. VENNEM seconded the motion, which was unanimously carried.

Mr. J. THOMSON moved that, as recommended by the directors, a dividend at the rate of 3 per cent. per annum be declared for the past half-year. He was very pleased indeed to see the statement of affairs that had been laid before the meeting. It was a very satisfactory one, he thought, all things considered; and he only wished, in moving the resolution, that he could have put in different figures. He had been a director for some time, but he was now only a shareholder, and he might say he would have liked, if they could have seen their way, to declare something more than 3 per cent. He did not care how small the increase was. He wished them to understand he was not criticising the board. He was only giving expression to what was felt by the shareholders among whom it was pleasant to sit after being on the board. (Laughter.) He considered to have declared an increased dividend would have had a beneficial effect. Their shares just now had practically no quotation. Why they should be in that position he did not know, as the British Guiana Bank was likely to be an institution as long as the colony was a colony. He thought if they declared a small amount over 3 per cent. it would be enough to give their shares a quotation. If they could pay even a half per cent. more during the year it would give their shares a quotation, and give people more confidence in the institution, and at the same time would signify the change that had taken place in the business of the bank. He was pleased to see the directors had the nerve to write the £40,000 off the surplus fund. He considered they had done the proper thing.

Mr. BALDWIN seconded the resolution, which, on being put to the meeting, was carried.

Mr. G. GARNETT moved and Mr. JEFFREY seconded, "That the sum of \$40,000 be written off the surplus fund for depreciation in the value of sugar properties in the possession of the bank."—Carried.

Mr. WOOLFORD moved and Mr. L. M. HILL seconded, "That this meeting sanctions the appropriation to the superannuation and retiring allowance fund the sum of \$500 from the surplus fund."—Carried.

Mr. COLBECK moved and Mr. HOWELL JONES seconded, "That a copy of the report be laid before His Excellency the Governor, and that a report of the proceedings of the meeting be printed for circulation among the proprietors."—Carried.

Mr. HOWELL JONES said it gave him great pleasure to move a hearty vote of thanks to the Chairman and directors for the services they had rendered during the past half-year. He had been a member of the board of directors, and he knew the arduous nature of the task they had, and he fully appreciated and congratulated them upon the present report. The duties of the Chairman were much greater than those outside of the directorate knew. The Chairman had constant and continuous work, and had to give a great deal of thought during the day, and even at night, to the business of the bank. He included in his proposal the manager and officers of the bank.

The vote having been accorded,

The CHAIRMAN, in replying, said, with reference to what Mr. Thomson had said, he hoped they might be in a position at the next meeting to recommend a slight increase on the dividend, but, at the same time, he qualified that by saying that at the present moment they could not hold out any definite hope.

Mr. LANE also expressed his thanks for the expressions of confidence in him.

Messrs. G. Garnett and Jeffrey were then appointed scrutineers in the election of the five directors. On their report, Messrs. Sproston, Luard, Fleming, Abraham, and T. Garnett, the retiring directors, were declared re-elected.

The meeting then rose.—Demerara Daily Chronicle.



## NEW ISSUE.

## HANNAN'S CONSOLIDATED GOLD MINES.

This company is formed to acquire gold mining properties in the Hannan's District, Western Australia, comprising 48 acres. The properties are situated within the proved auriferous belt, about two miles from the Hannan's Township, on the Broad Arrow-road, and have three distinct reefs running through them. Mr. T. E. Hardy, M.E., reporting on the property, says:—"There is a strong vein of ironstone and quartz running in a north-westerly direction through the leases; the outcrop can be traced for several chains on the surface, and in some places very wide. Average samples taken from this shaft assayed from 2½ to 3 ounces per ton. There is a large ironstone outcrop in the centre of the property, which shows traces of gold, and should open up well. Timber suitable for mining purposes is plentiful within a reasonable distance from the mine. There is a good battery site on the property, and water could be obtained by sinking. A good supply has been struck on other claims in the same locality. The lode formation is similar to other well-known mines on the Hannan field, being in the line of the various lodes that have been opened up through the Brown Hill, Hannan's Hill, and other mines on the same auriferous belt. The Caledonian should prove a valuable investment, and rank among the best mines at Hannan's." In addition to the above report, before the terms of purchase were concluded, the independent opinions of three of the best-known mining experts on the field were obtained—viz: Mr. Leslie Norman, Mr. Fearby, and Mr. H. M. Deakin. Mr. Deakin says:—"I can only confirm the foregoing statements. I have doped an average sample, the result has been 3 ounces of gold per ton. I strongly recommend the mines. The titles are in perfect order, transfer deeds are registered according to instructions, and lodged with the bank of Western Australia." The capital of the company is £150,000, divided, in £1 shares, of which 50,000 are now offered for subscription. The list will close on Monday for town and country.

## REPORTS FROM THE MINES.

*We find it necessary to announce that, owing to the vast numbers of mines, reports, and items of mining intelligence which reach us invariably very late—up to, and frequently after the time of going to press—it is impossible to guarantee the insertion of all of them in the issue in which, in ordinary course they should appear. We always endeavour, however, to make this important feature as complete as possible, and if the secretaries of mining companies, mining captains, and others would kindly make an effort to let their reports, etc., reach us early on Fridays, when it is not possible to let us have them earlier in the week, their doing so would go far to ensure their insertion, and to promote the completeness of our Mining Intelligence.*

## BRITISH MINES.

**FOXDALE (Isle of Man).**—February 6: Beckwith's engine shaft. Fair rate of progress continues to be made with the sinking of this shaft below the 275 fathom level, there being no particular change in the nature of the ground. 275 fathom level. The lode in the west driving presents much the same appearance as for some time past, producing from 2½ to 3 tons lead ore per fathom. The end driving on the north lode is yielding ore, but not sufficient quantity to value. The driving of the east end has been resumed. The lode, although looking promising, is not at present producing much ore. We expect before the end of the current month to communicate the rise from the roof of this level to the 260, which will not only ventilate this part of the mine, but open out what we anticipate will prove a profitable section of ground for stoping.—260 fathom level. There has recently been an improvement in the value of the end driving west on the south lode. For some time past the lode has been letting out an increased quantity of water and altogether looking encouraging. The end driving in the same direction on north lode has been changeable and irregular in value, yielding from 1 to 2½ tons lead ore per fathom. In the east level we are crosscutting to prove the north part of the lode. There is nothing new of importance to report in the levels driving at the 245, 230, and 215. At the 200 fathom level a rise has been commenced towards Pott's shaft from the crosscut driven north from the main level, which will be pushed on as quickly as possible.—Pott's shaft. The double skip and ladder roads have been completed to the 185, and the shaftmen are at present cutting out ground for trip lode, Lark engine, &c., at this level. When completed we shall be in a position to resume sinking the shaft. There is no change in the lode driving east and west at the 115 fathom level. The stopes and pitches throughout the mine are yielding their usual quantities of ore. Our returns for the quarter are 1150 tons.—W. H. Kitto.

**POLBERRO MINE.**—St. Agnes, Scorrer, Cornwall, February 11: The 500 crosscut south is still being driven through a splendid channel of ground, containing rich branches of tin. Water is coming out of the end freely. I should judge by the appearance of the end that the lode is near. The lode in the 26 east still presents a very fine appearance, and is yielding good stones of tin. Judging by its appearance, I think we may expect an early improvement.—John Harper.

**WEARDALE LEAD.**—Report on Wardale Company's mine for week ending February 8: Groverake. The vein has not yet been reached in the crosscut to Greenclough vein north from Adamson's drift, 60 fathom level east, sparry vein, but continues poor in ore, worth 6 cwt. per fathom. Tribute ore for the week returned at 14 bins.—Boltburn. Stopes in north flats from Watt's level worth 36, 34, 24, 30, 18, and 6 cwt. per fathom. Stopes in south flats worth 16, 40, 8, and 16 cwt. per fathom. Vein stopes worth 18 and 34 cwt. per fathom.—Greenlaws. Nattraas gill drift, drifting east in plate under Quarry hall in part of vein, no change. Watson's drift we are now crosscutting about 23 fathoms back from forehead about the cross vein. The vein shows more strength as we get further away from Greenlaws vein. Race's drift, vein nipped and still divided; we are driving in the sparry part of vein, worth 14 cwt. per fathom. Stopes worth 16, 10, and 10 cwt. per fathom. Slaty hazel drift east, stopes worth 14 cwt. per fathom. Lowe's drift, strong vein, composed of spar, rider, and other vein stuff, with some ore, but not to value. Quarry level, stopes worth 10 cwt. per fathom.—Sedling. Driving 64 level east, vein 4 feet wide, of spar and rider, mixed with ore, and worth 14 cwt. per fathom. Stopes worth 16, 14, 10, and 8 cwt. per fathom. In opening the 56 level east we find it very small, and have to blast the sides and roof. Stopes above 56 level worth 16 and 16 cwt. per fathom. Driving the 74 east on the south side of the vein about 2 feet of the bottom is hard stone, the rest is plate and grey beds. Ore raised for the week, 54 tons; ore dressed for the week 55 tons; ore and slag smelted for the week 94 tons, producing 46 tons of pig lead.

**WHEEL FRIENDLY.**—St. Agnes, Cornwall, February 10: I beg to inform you that the water is gradually going down. It is now 2 fathoms below the 10 fathom level. If it continues to go down as it has been going we shall be able to work on the old tin ground in about a month from this time. We are still stoping in the bottom of the 10 fathom level. The stuff now being raised, while not so rich as the old stopes, is still worth stamping. I expect to have a small parcel of tin ready for sale in about a fortnight.—(Signed) Charles Cole.

**WEST KITTY.**—St. Agnes, Scorrer, Cornwall, February 13: The rise in back of 84 fathom level, west of Reynolds' shaft, is worth for tin £9 per fathom. The 72 level, driving west of Rey-

nolds' shaft, is producing good stones of tin. The 60 end driving west of Reynolds' shaft, the lode is 3 feet wide, and worth £8 per fathom. The rise in back of this level is worth £14 per fathom.—Thomas' shaft. The shaftmen are making the necessary arrangements for cutting plat, and sinking below the 60 fathom level.—The 60 end, driving east of Thomas' shaft, the lode is about 3 feet wide, and worth £9 per fathom. Our stopes and tribute pitches continue to yield the usual quantity of tin.—(Signed) John Williams, Joel Hooper.

**WHEEL METAL AND FLOW.**—Progress report, February 14: Wheel Metal, Watson's shaft. Since the issue of our last report we have been troubled by a large influx of water from the shallow adit, which for a time overcame all our efforts to keep the mine in fork. This adit has now been cleared and secured, and we do not anticipate any further trouble from this cause. The 27th fathom level has been driven westward about 62 feet in all. The lode in the end is about 2 feet wide, and is mainly composed of a very hard capel, which contains a little tin, but not enough to pay for stamping at present prices. We shall push on here in the hope of finding a shoot of ore near the Valley Flookan, as was the case in the famous parallel lode (Wheel Vor), which lies 300 fathoms to the northward. Cock's shaft has been cleared to a depth of 84 feet from the surface, and the brace of shaft secured. The grinders are now at work at Wheel Metal on sand washed down from the Flow, and our tin sales will soon show a considerable increase.—Wheal Fortune. The tram road has been extended to the south side of the quarry, and we are now removing a strip of over-burden on that side. This over-burden contains a little tin, which we are saving. We are greatly in want of crushing machinery for treating the immense body of low grade stuff in the Fortune Quarry, and the directors are now considering the best means to supply this want. The total number of persons employed under and above ground is now 51.

## COLONIAL, INDIAN, AND FOREIGN MINES.

**BARBERTON REEFS.**—The mine superintendent, under date of January 17, reports by mail as follows:—A reef lying between a flinty bar, bearing south by north with a dip of 80° to the west, is now being opened up in your No. 1 Block; it prospects well on the surface, and I am opening it to see how it prospects below surface. The workmen's quarters are erected, timber is being cut, water being opened up, and I am preparing a mill site. The main drive, in which we have cut through a chute, I am of opinion will pay to follow up. The battery is expected, together with houses, at Delagoa Bay by the end of January. The Zwartkopje people have cut a good road down to their working. With regard to the new railway into Barberton, the rails are laid to within four miles of the town, and the engine will be in the station here next week. The superintendent is now treating for the company's water rights on the Queen's River, for the electrical transmission of power to the mines.

**BREMNAES.**—The following report has been received from the mine, dated Hagesund, February 8: Rivig Mine. There is little alteration in the 300 north level. The quartz averages about 1 foot in width, but at present is not carrying quite so much galena as has been the case. The lode is well defined and the quartz is increasing. In the winze in bottom of 300 north the quartz has an aggregate width of nearly 2 feet. Very little mineral is being met with in the lode. A sample of quartz taken from the working panned gold. The amount of quartz in the 200 south level does not increase, but the quality of same is good. We are just here driving through disturbed ground and can scarcely expect improvement within the next 20 feet or so. The quartz in the 100 south level shows well with a width of over 2 feet. A layer of quartz on footwall contains copper pyrites and a little galena, and assays 7 dwts. gold per ton.—Gapeiskog Mine. The level driving north from shaft has a lode over 5 feet wide, of which nearly 2 feet is quartz. The quartz carries galena and copper pyrites and stones, showing gold, are being broken from the working. The rise and stopes in back of upper level are without change.—Fladeren Mine. The men are sinking on lode in open cutting, and are making good progress. There is an exceptionally fine lode in present bottom over 3 feet in width. The quartz is of excellent quality, containing galena in abundance. Several samples have panned gold. The coal vessel has arrived, and is now discharging. We start milling on Monday.

**BROWN HILL EXTENDED.**—Progress report for fortnight ending December 27: New main shaft. This shaft has been sunk another 23 feet; total from surface 84 feet, and from brace 94 feet. No change in ground, only less mixed up with ironstone bands. A signal apparatus has been fixed so as to hold communication with the bottom of shaft and the surface. A double length of ladders has also been made and lowered in shaft.—General remarks. Although the shaft has been going through a decomposed formation with ironstone veins running through same (with the exception of the first 12 feet), nothing of importance has been discovered so far, just the trace of gold only in two of the veins, which I have put on one side by itself. Prospects taken and tried daily. Two days were observed as holidays—viz., Christmas Day and Boxing Day.

**CASSIDY HILL (Coolgardie).**—Mine report for the week ending December 14: Main shaft. During the past week shaft has been sunk 4 feet, total 152 feet from surface. No. 2 shaft has been sunk 6 feet, total from surface 132 feet. At 130 feet on main reef, which is far more settled than it was at the levels above, and the leaders in it show fair gold. Have about 18 feet further to sink to get to same level as 170 feet in main shaft. Will push on with drive into main reef as fast as circumstances will allow. Will send samples from main reef.

**CHIAPAS.**—Mine report for fortnight ending December 31: Santa Fe Hill drift No. 3. Driven 4 feet, total 177 feet; no change.—Santa Fe Hill, drift No. 3 crosscut. Driven 9 feet, total 30 feet 6 inches; no change.—Taylor main extension. Driven 6 feet 6 inches, total 700 feet 6 inches; no change, suspended.—San Juan extension crosscut north west. Driven 6 feet, total 26 feet. Drove another 6 feet, and then suspended. Face shows fair ore.—San Juan extension. Driven 3 feet, total 75 feet. In very good ore, assaying gold 14 dwts., silver 10 ounces 11 dwts., copper 610 per cent.—San Francisco adit. Driven 14 feet, total 78 feet. Roof still needs supporting by sets.—Providencia. Auer crosscut east. Driven 16 feet, total 44 feet. Passing out of dyke into wollastonite.—Santa Fe stopes east crosscut. Driven 4 feet, total 19 feet; no change.—Providencia crosscut east No. 1. Driven 25 feet, total 238 feet. Passed out of wollastonite into a clay rock.—Extraction, Old Providencia. Extracted 308 tons of very good ore, assaying gold 1 ounce 3 dwts., 12 grains, silver 12 ounces 11 dwts., 18 grains, copper 755 per cent.—Santa Fe stopes. Sent 62 tons to mill. Santa Fe stopes west assayed: Gold 5 dwts., silver 4 ounces 1 dwt., copper 175 per cent.—San Juan stopes. Extracted 183 tons of fair ore. Assay: Gold 6 dwts., 12 grains, silver 6 ounces 1 dwt., copper 250 per cent.—Auer stopes No. 1. Assay: Gold 7 dwts., silver 5 ounces 9 dwts., copper 246 per cent.

**CROWN REEF.**—Results for January: Yield in smelted gold from 120 stamp mill, 3544 ounces; yield in smelted gold from 120 stamp cyanide works, 5346 ounces; total, 8890 ounces.

**EAGLE'S NEST.**—Report for the month ending December 31: Fig Tree creek, first level. 14 feet were driven, making a total of 57 feet. Average fire assay, 10 dwts. 16 grains. The reef here is improving, both in width and value.—Second level. 21 feet 9 inches were driven, making a total of 156 feet 3 inches. Average fire assay, 5 dwts. 19 grains.—Third level. 25 feet 6 inches were driven, making a total length of 213 feet. The reef appears to be widening, and is of a more solid nature. The average assay for the month is 10 dwts. 16 grains. The crosscut driven during the month, 25 feet 6 inches, at this level from the south reef level has holed through into the main reef level, thereby giving us a good ventilation.—Oratava end, first level. 18 feet have been driven on a reef about 18 inches wide, and assays 5 dwts. 19 grains.—Second level. The south reef was driven 27 feet, total to date 53 feet. The reef is well defined, and assays 6 dwts. 18 grains. Crosscut east driven 6 feet.—Third level. 27 feet 3 inches were driven, making a total of 158 feet 3 inches. The reef is look-

ing very strong, and maintains its width. Average fire assay 12 dwts. 15 grains. Average fire assay of the foregoing 8 dwts. 16 grains. Total footage for the month, 163 feet.

**GELDENHUIS ESTATE.**—Summary of operations for December: Quarts mined, 14,598 tons of 2000 lbs.; quarts milled (130 heads), 14,165 tons of 2000 lbs.; yielding smelted gold 3541.46 ozs., valued at £12,357 18s. 3d.; tailings treated, 8582 tons, 1240 ounces, concentrates treated, 530 tons, 318.45 ounces; equal £3801 11s. 6d.; total, 5099.94 ounces, equal £16,159 9s. 9d.; cost, £2694 8s. 2d.; mining and hauling, 7s. 6.39d.; transport, 4.55d.; milling, 2s. 7.36d.; general maintenance, 2s. 6.52d.; 13s. 0.82d.; charges, 4.98d.; 13s. 5.80d.; expended on mine development, 4s. 5.10d.; £2134 4s. 6d.; 17s. 10.90d.; cost of producing and treating concentrates, £215 7s. 9d.; cost of treating tailings, £1119 11s. 4d.; £14,163 9s. 9d.; profit for the month, £1996.—Capital account. Expended on machinery, new shafts, &c., £2271 16s. 10d. Number of feet driven and sunk during month, 1025½ feet. The ore development for the month amounted to £28,020 tons.

**GREAT BOULDER PERSEVERANCE (Kalgoorlie).**—Manager's report for three weeks ending January 3: No. 3 shaft. This shaft has been stripped 24 feet for the last three weeks to full size 10 feet by 4 feet in the clear, and has been timbered 9 feet.—No. 2 shaft. This has been sunk another 3 feet, making total depth 53 feet, and stopped on account of footwall coming in. Now driving on crosscut of lode, which is showing fine gold.—No. 7 shaft. This shaft has been sunk a further depth of 3 feet, making the total depth 38 feet, and has been timbered 19 feet.

**GREAT BOULDER EAST EXTENDED.**—Fortnightly report ending January 3: No. 1 shaft. The crosscut at the 152 feet level has been extended a further distance of 15 feet, total 22 feet. The country passed through consists of decomposed diorite, intermixed with ironstone and quartz veins. Samples taken show traces of gold. A complete ladderway has been put up in this shaft.—No. 2 shaft. The crosscut has been extended 12 feet, total extension 139 feet 6 inches. The country passed through in this crosscut consists of iron gossan. Samples show good prospects.

**GREAT SOUTHERN TIN AND GOLD FIELDS.**—The mining manager reports: Toora, Victoria, Australia, January 4: During the past month have finished the whole length of rock cutting at north end of tunnel, total length 389 feet, of which 174 feet is in the open, and 215 feet boxed and filled in, leaving 6 feet by 4 feet water way. The whole made secure enough to last the next 50 years. On December 29 we commenced erecting dam across the River Agnes, where the head of the race will be. It will be 124 feet long by 10 feet high, and be erected according to plans submitted and approved, and be of a most substantial character. Before commencing work, cleared a site for camping (as work once started must be continuous). Erected saw-pits, &c. Expect to complete by end of month. Total length of tunnel completed, 747 feet. Cutting now completed, total length 389 feet.—By cable: "Melbourne, January 29:—Dam finished. Re-commenced work on tunnel."

**GULLEWA.**—The manager of the Gullewa group of mines cables that he has made a thorough re-examination of the property, the result of which confirms, in every detail, the previous high opinion which he had formed of the value of these leases. An excellent site has been chosen for the battery, which will be ready for the erection of the machinery, now on its way to the property. There is an abundant supply of water. Owing to the extensive area of the property, an additional main shaft has been put down. This will furnish a regular supply of ore for the mill. Application has been made to amalgamate the leases, and permission obtained to concentrate the labour.

**JUMPERS.**—Summary of operations for the month of December: 100 head mill. To mining 7961 tons, 12s. 3.77d., £4901 18s.; to hauling and pumping 7961 tons, 3s. 8.17d., £1465 5s.; to transport 7961 tons, 5.39d., £178 18s. 11d.; to milling 7961 tons, 8s. 2.57d., £3269 18s. 1d.; to charges 7961 tons, 1s. 2.59d., 25s. 10.49, £484 2s. 7d.—£10,300 2s. 7d. To redemption on 7961 tons, 4s. £1592 4s.; cost per ton, 29s. 10.49d., £11,892 6s. 7d.; to cost of treating 5230 tons tailings, £1008 16s. 3d.—£12,901 2s. 10d.; profit for month, £4366 18s. 2d.—£17,268 1s. By 3325 ounces gold at 7s. £12,302 10s.; by concentrates, 823 ounces, £2527—£14,829 10s.; by 812.85 ounces gold from tailings, £2438 11s.—£17,268 1s.—Total receipts and expenditure for month. To cost, mining, and milling, £10,300 2s. 7d.; to cyaniding, £1008 16s. 3d.; to plant account, &c., £1049 16s. 5d.; to mine development, £214 0s. 8d.; to buildings, &c., £378 2s. 1d.; to balance, £3617 3s.—£17,268 1s. By gold, concentrates, and tailings, £17,268 1s.—£17,268 1s. Driven and sunk during month, 91 feet. Mill ran 23 days, owing to the recent unsettled state of things, want of coal, and scarcity of native labour.

**KAPANGA.**—The directors have received the following information from the manager, viz.:—Shaft has been sunk 23 feet for the month. Total depth 885 feet. We have intersected a vein in the shaft. The ore contains specks of visible free gold. There is a great improvement in the country rock. Have crashed 33 tons, yield 65 ounces of gold.

**MEYER AND CHARLTON.**—Report for the month of December: Mine. Number of feet driven, sunk, and risen, 533; quarts mined, 7069 tons.—Mill. Number of days (24 hours) working 60 stamps, 29; ore crashed, 7328 tons; yield in smelted gold, 2361 ounces 0 dwt. 24 grains; yield per ton, 6 dwts. 10.651 grains.—Cyanide works. Tailings treated, 5265 tons; yield in bullion, 935 ounces 14 dwts. 11.52 grains; yield per ton treated, 3 dwts. 13.308 grains; working cost per ton treated, 3s. 5.529d.—Expenditure and revenue. Working expenditure. To mining (including maintenance), £3596 2s. 10d.; to transport, £75 17s. 5d.; to milling (including maintenance), £1275 19s. 5d.; to cyanide works (including maintenance), £912 19s. 7d.; to general charges, £864 5s. 7d.; to mine development redemption account, £1099 4s.; profits for month, £3708 8s. 5d.; total, £11,532 17s. 3d.—Revenue. By gold accounts—2361.005 ounces from 60 stamp mill, at 7s. 6d. per ounce, £8676 13s. 10d.; 935.724 ounces from cyanide works, at 60s. per ounce, £2907 3s. 5d.—£3296 729 ounces. By rent, £49; total, £11,532 17s. 3d.—Working costs. Mining expenses, 9s. 1.082d. per ton; transport, 2.485d. per ton; milling, 2s. 9.542d. per ton; cyanide works, 2s. 4.401d. per ton; general charges, 2s. 4.406d. per ton; maintenance (mine, mill, and cyanide works), 1s. 6.444d. per ton; mine development redemption, 3s.; total working costs, £1 1s. 4.263d. per ton; value of yield, £1 11s. 4.110d. per ton; profit, 9s. 11.850d. per ton.—Expenditure on capital account. Mine development, £1427 16s. 6d.; machinery, plant, and buildings development, £631 1s.; main incline shaft, £122 0s. 11d.; total, £2180 18s. 4d.—Crashed during the month. Main reef, 2426 tons; south reef, 407 tons; Leader reef, 825 tons. A dividend of 25 per cent. of the half-year ended December 31 has been declared, and will be paid, after receipt of European transfer lists to that date, in the early part of February.

**UNITED GOLD FIELD OF MANICA.**—Reasend reef. Extracts from manager's report, dated December 27:—Crosscut from No. 3 shaft. The reef over all is 24 feet 3 inches wide, of which 16 feet 6 inches is quartz, all parts of which pan a little gold, and all the cellular quartz, a very considerable amount of gold. No. 3 shaft crawls down slowly through hard reef quartz. The reef here must be a great width too. The reef in this shaft is probably in one mass, but in another 18 inches sinking, which makes the depth 70 feet we will drive off north and south and see what the full thickness is. Panings from the fresh, massive, and clean-looking quartz showed only a little gold, but the cellular and encrusted quartz gave very fine results, and show in some specimens coarse visible gold.

**WHEELER HILL.**—Extract from letter written by Professor George A. Treadwell, Sonoma, California, January 23:—Just had assay of 40 feet wide, stuff lately cross cut in Wheeler Hill; heavy sulphurates just the stuff for cyanide working. I inclose copy of assay (gold, \$6.20; silver, 4 ounces per ton). We all feel so good over it, that makes it a million dollar mine. The tunnel across the Wheeler Hill mother lode is in 275 feet now. Mr. Hill, local manager, has subsequently cabled:—"Struck ledge, looks well."

The GWANDA (RHODENSIA) CONSOLIDATED DEVELOPMENT COMPANY (LIMITED) has received advice that the transfer of the properties has now been completed.



**ALAMILLOS.**—Mine report dated January 29: The 40 fathom level driving east of Santa Agueda's shaft continues to lay open good stopping ground, and is valued at 1 ton per fathom. In the 70 north of San Felipe shaft the men will now drive on the course of the lode. The lode in the 85 west of Taylor's engine shaft is stronger, and has a better appearance. It is now estimated at  $\frac{1}{2}$  ton per fathom. In the 160 west of the same shaft the lode is of no actual value at present. The 100 east of Judd's engine shaft continues to open out well, and the lode is now valued at 3 tons per fathom. Herman's winze sinking below the 60 fathom level, valued at  $\frac{1}{2}$  ton per fathom. This is situated east of Judd's shaft, and is over the good lode in the 100 fathom level. Marques winze below the 100 fathom level, and prove the nature of the ground west of Judd's engine shaft. The stopes continue to yield well. Surface works are kept on very regularly, and machinery is in good working order. Estimated raisings for February 250 tons. The tributers returned 43 $\frac{1}{2}$  tons of mineral in the past month.

**AUSTRALIAN MINING COMPANY.**—Fortnightly report of Mr. John James, manager, dated December 19: During the past fortnight the contractor has sunk the shaft a further depth of 30 feet, total 633 feet; and timbered 27 feet, total timbered 616 feet. The first 18 feet of this sinking was through boulder conglomerate, then 6 feet of light grey conglomerate of a blocky nature. At present the sinking is through a light green conglomerate very hard for boring, but breaks well. The water keeps about the same as last reported. Fortnightly report of Mr. John James, dated January 2: During the past fortnight Bishop and party have sunk the shaft a further depth of 14 feet, total 617 feet, and timbered to 616 feet. The country sunk through was hard green conglomerate with yellow streaky veins through it; this is by far the hardest country yet met with in the sinking; there is no indication of the slate country yet.

**AUSTRALIAN BROKEN HILL.**—The mining manager reports by mail for the fortnight ended January 2 as follows:—Block 96, 28 $\frac{1}{2}$  level east, prospecting drive, No. 4 rise, stopes driven 5 feet. No change. 280 level east, No. 1 rise, stopes driven 6 feet. No change. No. 3 rise driven 3 feet 6 inches, total 54 feet 6 inches. Lode strong, consisting of carbonate of iron and iron. Incline. On account of the water rising during the holidays, no work has been done here. No. 6 level east driven 5 feet, total 90 feet. Lode widening, showing a little galena. No. 5 level east driven 5 feet 6 inches, total 271 feet 6 inches. The lode here contains more mundie, and making a little more water. No. 4 level east, No. 1 rise, stopes driven 8 feet. The lode carries a strong vein of carbonate of iron, containing fahlerz, galena, and ruby silver. Note. The quantity of rock mined during this fortnight was 1230 cubic feet.

**BAYLEY'S REWARD CLAIM.**—The mine manager reports under date, Coolgardie, December 18: The only work going on now is, of course, sinking the main shaft, and also continuing the two crosscuts east and west at the south end of the long drive on course (reef should have taken) of reef. I shall do as you ask, and have run out the approximate cost of sinking the shaft itself. Oil. The Port Stephens is in, I hear, so we may soon expect to receive the 1800 gallons. (Signed) Tom F. Browne, acting manager.

**BRITISH BROKEN HILL PROPRIETARY.**—Mine manager's report for four days ending December 31: Blackwood shaft, 300 level. West crosscut advanced 7 feet, total from plat 151 feet, face showing milling sulphides of hard nature so far. We mined 18 tons sulphide, averaging 16 per cent. lead, 14 ounces silver, and 12 per cent. zinc.—200 level. No. 1 winze in No. 1 crosscut sunk 2 feet, total depth 79 feet, bottom still in sulphide ore of milling grade. We sorted out 5 tons, averaging 16 per cent. lead, 13 ounces silver, and 10 per cent. zinc. North drive off No. 1 crosscut driven 6 feet, total 66 feet, hard country intrusion in face at present. We mined 3 tons sulphide, assaying 14 per cent. lead, 11 ounces silver, and 22 per cent. zinc. North drive in western extension extended 4 feet, total 74 feet, drive now entering better grades sulphides. We mined 16 tons sulphides, averaging 23 per cent. lead, 13 ounces silver, and 19 per cent. zinc.—Howell shaft, 300 level. Westerly crosscut lengthened 9 feet, total from plat 223 feet, and now have reached sulphide body, and face to-day assays very well. Two tons broken from the surface averaged 25 per cent. lead, 15 ounces silver, and 20 per cent. zinc.—200 level. South drive off No. 2 west crosscut advanced 9 feet, total from crosscut 106 feet. Intrusion has disappeared and face of drive now carries fair grade sulphide ore again. West crosscut off south drive extended 4 feet, total 31 feet; are just reaching hanging wall in which the winze will be sunk to 300 level. We mined 21 tons, averaging 20 per cent. lead, 11 ounces silver, and 24 per cent. zinc.—Surface. Fair progress was made on new change house, store room, and machine shop, all of which are about finished, splendid headway being made in every branch of new jiggling plant.—Ore shipments. Shipped during week 134 $\frac{1}{2}$  tons (gross) sulphide ore to Block 14 Mine, also 10 trucks of carbonate ore from Marsh shaft to Port Adelaide. The following parcel of ore has been delivered and sold to Block 14 works, Port Adelaide—viz., 112 $\frac{1}{2}$  tons (net) carbonate ore from Marsh shaft, containing 244 tons lead, and 5449 ounces of silver.—Week's assays. Carbonate, 22 to 23 per cent. lead, 38 to 46 ounces silver per ton; sulphides, 9 to 25 per cent. lead, 7 to 15 ounces silver per ton, and 10 to 25 per cent. zinc.

**CRESCENT GOLD.**—Fortnightly report of Mr. T. G. Davy, superintendent, dated January 3: Crescent Mine. South tunnel towards main shoot advanced 24 feet 6 inches, total 354 feet 6 inches. Ground hard and traversed by a number of small quartz veins. Winze below drive south of Richardson's old tunnel sunk 5 feet, total 35 feet. Rock changing from oxidised ferruginous slate and sandstone to hard blue sandstone. Lode poor at this point.—Victory Mine. Drive north of deep tunnel on Neil's shoot advanced 4 feet, total 43 feet. Lode 2 feet wide, and valued at  $\frac{1}{2}$  ounce of gold per ton. Drive south of same tunnel advanced 1 foot, total 43 feet. Lode widened to 3 feet, and valued at 2 ounces per ton. It will thus be observed that this rich shoot of stone has now been developed for a length of 86 feet, and that it is still extending, and is highly payable at both the north and south ends. Tenders are about to be called to extend this tunnel in order to intersect the western lode, which, judging by surface indications, should be equally auriferous with Neil's shoot or eastern lode. Should this be the case the property will indeed be a very valuable one.—Returns. We cleaned up on the 24th ult. after crushing 18 $\frac{1}{2}$  tons from Neil's shoot, and obtained a return of 84 ounces 14 dwts. of melted gold, or 4 ounces 11 dwts. 13 grains of gold per ton. A portion of this stone weighing 4 cwt., which was bagged as it was broken while passing through an exceedingly rich pocket, was crushed separately and yielded 15 ounces of gold, equal to 75 ounces of gold per ton. This rich pocket is continuing under foot, and should yield large quantities of gold.—Erection of mill. The cutting of water race is almost completed, and we are now lining it with plain galvanised iron where necessary. We have completed the excavations for the mill, and all foundation and frame timber is now squared and on the ground. The Pelton wheel has been delivered at the mine, and the machinery should follow in a few days.—Orlando Mine. Deep tunnel extended 12 feet, total 161 feet. The hardness of the ground militates against such progress being made in this tunnel as might be wished.

**FORTUNA.**—Mine report, dated January 29: Canada Incoosa Mine. In the 110 fathom level driving west of San Pedro's shaft the lode is large, and looks promising, valued at  $\frac{1}{2}$  ton per fathom.—Los Baldos Mine. In the 212 east of Taylor's engine shaft the lode is strong and has a kindly appearance, worth 1 ton per fathom. The lode in the 200, east of the same shaft, is small and unproductive. In the 93 west of Palgrave's shaft we have not met with anything of value up to the present. Granero's winze sinking below the 200 fathom level valued at  $\frac{1}{2}$  ton per fathom. This is going down in a very kindly lode.

**HANNAN'S STAR.**—The mines superintendent reports for the month of December, as under: Main shaft. The eastern crosscut has been driven 18 feet during the month. The ground passed through was hard flint; if anything, harder than that met with in the west crosscut. The ground got so excessively hard on the 21st instant, that I decided to discontinue it, as we shall be able to prospect this eastern ground cheaper from James' shaft (which

is the name given to the new prospecting shaft). West shaft has been sunk 40 feet, making a total of 109 feet from surface. The ground passed through has been of slate and sandstone formation very favourable for sinking, the strata running almost vertical. Latterly the ground has become slightly harder; but still it breaks very well, and fair progress has been made. Up to the present we have done all the winding with the windlass. When a sufficient supply of water is struck, I shall erect a whip and sink further for water. Water was met with last week, and is increasing slightly. At present it will be about 2 gallons per hour. This will, no doubt, increase as we go deeper, and I shall push on with this work as fast as possible.—James' shaft. This shaft is situated about 2 $\frac{1}{2}$  chains from our north boundary, and on a line with the lode found in the Boulder Main Reef Company's property. I let a contract for sinking this to a depth of 80 feet; and the contractors finished their work on the 24th instant. The ground passed through was soft sandstone, with ironstone veins running from east to north. I am turning now west to crosscut the lode, which I anticipate cutting in 50 or 60 feet. A whip has been made and erected, and we shall in future pull all stuff by horse-power.—General. I have had the smith employed during his ordinary working hours in making tanks for water. One of 600 gallons has been completed, and a second is well in hand. I have got curved corrugated iron sufficient to make another.

**HARRIETVILLE.**—Fortnightly report of Mr. T. G. Davey, superintendent, dated January 3: Tiddledes Mine, Bibby's new lode. The shaft has been sunk to a further depth of 11 feet, total 76 feet. The lode at bottom of shaft is about 2 feet wide, and valued at  $\frac{1}{2}$  ounce of gold per ton. In the stopes below the 40 feet level, the lode is maintaining its size, but is not generally as auriferous as it was; we, however, expect an improvement when we open up at the 100 feet level. The crosscut east of tunnel east has advanced 4 feet, total 54 feet. Tenders are being called to drive towards Bibby's lode from tunnel F, which has now been cleaned out and timbered. We shall clean up during the coming week after crushing about 60 tons from Bibby's lode.

**LANGLAAGTE ESTATE, BLOCK B, LANGLAAGTE ESTATE, AND FORGES RANDPONTIN.**—In consequence of the shortness of labour brought about by the late disturbances, the production for the month of January shows a large falling off. Some of the mines had to close down for some days for want of coal, and at Forges Randfontein Gold Mining Company (Limited), apart from only half the usual quantity of ore being milled, no tailings could be treated, as there was not sufficient labour; but information has been received that the supply of labour will be increased now that the Government has taken the matter in hand.

**LINARES LEAD.**—Mine report, dated January 29:—Pozo Ancho Mine, Warner's crosscut. In the 200 fathom level driving west the lode is large, and is letting out a good quantity of water. The lode in the 200 east is at present unproductive. In the 178 west the lode is large, and turns out good stones of ore, and is valued at  $\frac{1}{2}$  ton per fathom.—Peill's engine shaft. In the 200 west we have not met with anything of value at present. The lode in the 155 west continues regular and compact, and is estimated at  $\frac{1}{2}$  per ton per fathom. Good progress is being made in the sinking of No. 279 winze below the 155 fathom level, but at present the lode is poor. The stopes continue to yield well. The works at surface are going on very regularly, and the machinery is working well. Estimated raisings for February, 200 tons. The tributers returned 83 $\frac{1}{2}$  tons of mineral in the past month.—Los Quintinos Mine. Taylor's engine shaft. In the 200 south the men are making good progress. The lode in the 185 east is turning out some good stones of ore, and is valued at  $\frac{1}{2}$  ton per fathom. In the 165 east the lode is still wide and strong, estimated at 2 tons per fathom. In the 150 east the lode is large, and looks promising, and is valued at  $\frac{1}{2}$  ton per fathom. Alfonso's winze, sinking below the 130, has now holed to the 150 fathom level. The lode was valued at  $\frac{1}{2}$  ton per fathom. Estimated raisings for February, 150 tons. The tributers' returns in the past month amounted to 66 $\frac{1}{2}$  tons.

**MYSORE WEST AND MYSORE WYNAD CONSOLIDATED.**—Tank Mine. Half monthly report to January 15: South shaft. The 507 crosscut west has been driven in 76 feet 6 inches, making a progress of 23 feet 3 inches. The end is still in very hard rock, and there is no sign of the lode at present. From the way the winze is going down in the 450 level south we do not expect to cut the lode much under 100 feet. The plat is nearly out, but the deadrock is difficult to remove. 450 north has been driven to a distance of 468 feet, making a progress of 17 feet. The end has hardened, and the quartz there is very small and poor. Stope north of No. 2 rise is 3 $\frac{1}{2}$  feet wide, and worth 10 dwts. of gold per ton. Stope south of rise contains 1 foot of quartz, worth 1 ounce of gold per ton.—450 south. Winze in bottom has been sunk 25 feet, progress 17 feet 9 inches. The lode here is very mixed, and of no assay value. The hanging wall seems likely to come down, and if this occurs we hope to get a better lode with a steeper underlie. Stope north of rise is 6 feet wide, and worth 4 dwts. per ton.—Intermediate north. Stope here is 2 feet wide, and worth 6 dwts. per ton. The new mill was started on January 8, and the old mill stopped to repair framework. New mill running well.

**MYSORE REEFS (Kangandy).**—Fortnightly report of Captain M. Scantlebury, mine agent, dated January 22: Underlie shaft. This shaft has been sunk 6 feet 3 inches, now 65 feet 3 inches below the 425 feet level. The quartz is now 15 inches wide, assaying 9 dwts. 12 grains of gold to the ton. 425 feet level north has been extended 11 feet, now 131 feet 6 inches from shaft. The lode is 2 feet wide, composed of quartz, arsenical pyrites, and country rock, assaying 2 dwts. of gold to the ton. Winze below this level has been sunk 9 feet, now 17 feet below the level. The quartz is 1 foot 9 inches wide, assaying 2 ounces of gold to the ton.—Stope north of winze. The quartz is 1 foot 6 inches wide, assaying 1 ounce 6 dwts. of gold to the ton. 425 feet level south has been advanced 15 feet 3 inches, now 115 feet 6 inches from shaft. The lode is 1 foot 6 inches wide, composed of quartz, arsenical pyrites, and country rock, assaying 3 dwts. 6 grains of gold to the ton.—Stope in bottom 325 feet level south of winze. The quartz is 1 foot 3 inches wide, assaying 12 dwts. of gold to the ton.—Stope in bottom 325 feet level north of vertical shaft. The quartz is 2 feet wide, assaying 8 dwts. of gold to the ton.—Rise above the 250 feet level north. The quartz is 1 foot wide, assaying 15 dwts. of gold to the ton. Vertical shaft has been sunk 6 feet, now 306 feet 3 inches from surface. The quartz is 6 inches wide, assaying 3 dwts. 6 grains of gold to the ton. 260 feet level north has been advanced 15 feet, now 248 feet from shaft. The lode is 2 feet wide, composed of quartz, arsenical pyrites, and country rock, assaying 4 dwts. 12 grains of gold to the ton.—Stope in back 260 feet level. The quartz is 1 foot 6 inches wide, assaying 3 dwts. 6 grains of gold to the ton. We have suspended this.—Stope in bottom 260 feet level. The quartz is 1 foot 6 inches wide, assaying 9 dwts. 12 grains of gold to the ton. New north shaft has been sunk 4 feet 6 inches, now 86 feet 6 inches from surface.

**MOUNT LYELL MINING AND RAILWAY.**—Mine manager's report for week ending December 24: South drive, No. 3 tunnel. The face has been advanced 2 feet, total 524 feet. No change in character of ore. Pyrites well bearing away to the left.—South drive, No. 4 tunnel. 5 feet driven, improvement here in pyrites, which is showing fahlore and erubescite.—No. 2 crosscut, No. 5 tunnel. Face advanced 2 feet, total 11 feet. Solid pyrites, no change. (Four days work only in each face.)—Progress report for week ending December 27: Hauling line. Cutting in progress, dry walling toe of mine tip.—Smelter building. Roofing iron all laid, putting on iron siding, doing sundry inside work on bins, laying stringers and sleepers for railway line above bins.—Hill flue. Cementing arch completed, removing centres.—Main chimney. Height above grade 93 feet.—Boilers. Shell of both boilers in position on frames, about to erect and fit tubes.—Blast furnaces. Base plate and columns in position.—Converter site. Finishing work tram on site and foundations of retaining walls begun. Brick plant temporarily stopped, being well stocked with bricks. Weather fine.

**MOSMAN.**—Mosman. Mine manager's report for fortnight ending December 20:—North Australian. Have raised 28 tons of stone for the fortnight, of which 25 tons have been crushed for a

yield of 35 ounces 15 dwts. of gold.—Peabody. Underlie shaft sunk 5 feet, total from surface 433 feet. There are a few inches of quartz in the bottom, but the country is unsettled. 3 level north driven 8 feet, total length 67 feet. There is no reef at present in the face, but stone may be met with at any time. Have raised 45 tons.—Wyndham. Underlie shaft sunk 10 feet, total below 4 feet level 137 feet. Better headway has been made, the slide having gone over to the south side, and in a few weeks will probably have paved off altogether. 14 level north. The winze has been sunk 20 feet, total depth 82 feet. Good formation has been met with, carrying mineralised leaders of a good description.

**NUNDYDROOG.**—Thomas Richards: Report for the fortnight ending January 18: Main shaft has been sunk 3 feet, total distance 78 feet 6 inches below the 1080 feet level. Lode of no assay value. The 1080 feet level north has been driven 13 feet, total distance 325 feet 9 inches. Lode (part carried) 6 feet wide, assays 2 ounces 5 dwts. The winze below this level has been sunk 5 feet, total depth 10 feet. Lode 5 feet wide, assays 1 ounce 7 dwts. 12 grains. The rise in the back of this level has been put up 9 feet, total height 16 feet 6 inches. Lode 4 feet wide, assays 13 dwts. 18 grains. The lode in the stopes in the bottom of the 920 south is 7 feet wide, is assaying 1 ounce, and in the stopes in the back of the 920 north it is 6 feet wide, and assays 1 ounce 1 dwt. 6 grains of gold per ton. The lode in the stopes in the back of the 840 south is 5 feet wide, and assays 5 dwts. The 680 north No. 2 crosscut west has been extended 18 feet, total distance 21 feet 6 inches. No change. The 520 north has been driven 18 feet 6 inches, total distance 270 feet 9 inches. The 370 north has been driven 8 feet, total distance 129 feet. Lode well defined, but of no assay value.—Kennedy's shaft. The 700 level level crosscut west has been extended 12 feet 6 inches, total distance 101 feet. At 96 feet the lode was met with, and proved 3 feet wide, of an assay value of 18 dwts. 18 grains. Drivages were at once commenced on the course of the lode, 6 feet 6 inches having been driven south and 7 feet 6 inches north. In the former the lode is now 4 feet wide, assaying 15 dwts., and in the latter it is 2 feet wide of an assay value of 18 dwts. 18 grains. The 600 south has been driven 16 feet 6 inches, total distance 302 feet 6 inches. The lode, 3 feet 6 inches wide, assays a trace of gold. The 600 north has been driven 26 feet 9 inches, total distance 351 feet 3 inches. The lode is 1 foot wide, and assays 5 dwts. The 600 crosscut west has been extended 12 feet, total distance from the main level 42 feet. No change. In the stopes in the back of the 520 north the lode is 3 feet wide, and assays 12 dwts. 12 grains. The 440 south has been driven 21 feet, total distance 1265 feet. The 440 south crosscut west has been extended 13 feet, total distance 74 feet 3 inches. No change. In two stopes in the back of the 370 south the lode averages 3 feet 3 inches in width, and 2 ounces of gold per ton in assay value. The 370 south rise has been put up 24 feet 6 inches, total height 63 feet. The lode, 1 foot wide, assays 10 dwts. The 370 north crosscut west has been extended 13 feet, total distance 443 feet. No change. The 300 south rise has been put up 15 feet, total height 77 feet. Lode 1 foot wide, assays 15 dwts. The lode in the stopes in the back of this level is 3 feet wide, and assays 1 ounce 5 dwts. The 300 north rise has been put up 8 feet 6 inches, total height 90 feet. Lode 3 feet wide, assays 2 dwts. 12 grains. The 230 south has been driven 11 feet, total distance 220 feet. The lode 2 inches in width assays 5 dwts. The 230 south rise has been put up 13 feet 3 inches, total height 17 feet 9 inches. The lode, 1 foot wide, assays 1 ounce 18 dwts. 18 grains. In the stopes in the back of the 230 north the lode is 4 feet 6 inches wide, assaying 7 dwts. 12 grains. The 160 south crosscut east has been extended 6 feet 3 inches, total distance 7 feet 9 inches. Stringers of quartz have been met with, carrying a trace of gold. The 160 north rise has been put up 12 feet, total height 91 feet 6 inches, and has communicated with the ancient workings from surface. This rise has opened up some good ore ground. In the stopes in the bottom of the 160 north the lode is 3 feet in width, and assays 11 dwts. 6 grains. North shaft has been sunk 3 feet 9 inches, total depth 17 feet 6 inches below the 600 feet level. Lode 1 foot wide, assays 3 dwts. 18 grains of gold per ton.—Taylor's shaft. The 1240 feet level south has been driven 16 feet 9 inches, total distance 192 feet 6 inches. Lode 9 inches wide, assaying a trace of gold. The 1240 north has been driven 12 feet, total distance 208 feet. Lode of no assay value. In two stopes in the back of the 1000 north the lode averages 3 feet in width and 6 dwts. 6 grains in assay value. The 920 south rise has been put up 15 feet, total height 79 feet, and has communicated with the 840 feet level. At the point of communication the lode, 1 foot wide, assayed 6 dwts. 6 grains. Driving the 840 south has been resumed with the object of communicating with the 920 south rise, which has been effected. In two stopes in the back of the 840 north the lode averages 3 feet in width and 1 ounce 10 dwts. in assay value. In two stopes in the back of the 600 north the lode averages 2 feet 3 inches in width and 9 dwts. in assay value. In the stopes in the back of the 520 north the lode is 2 feet wide, and assays 5 dwts.; and in the stopes in the back of the 230 south it is 1 foot 6 inches wide, worth 10 dwts. of gold per ton. The new vertical shaft, which has just been commenced near the centre of the property, has been located some distance west from Kennedy's and main lodes with the object of cutting them in depth. This shaft will be furnished with powerful winding gear to assist in the extraction of the increased quantity of quartz that will be required for the mills; and safety cages will also be provided for lowering and raising the miners to and from their work underground. This shaft has already reached a depth of 30 feet, but has yet to be timbered, and as the ground has now to be blasted, this rate of sinking will not be long maintained.—Old mill sample. Pulp 1 ounce 2 dwts. 12 grains, tailings 3 dwts. 18 grains.—New mill samples. Pulp 1 ounce 3 dwts. 18 grains, tailings 4 dwts.

**NINE REEFS.**—Fortnightly report of mine agent, dated Jan. 21: Vyvyan's shaft. No. 1 stopes in the bottom of the 145 feet level north produces quartz from 4 inches to 6 inches wide, which assays 13 dwts. of gold to the ton. No. 2 stopes in the bottom of the 145 feet level north produces quartz from 5 to 7 inches wide, which assays 11 dwts. 19 grains per ton. No. 1 stopes in the bottom of the 145 feet level south produces quartz from 6 to 8 inches wide, which assays 16 dwts. 4 grains per ton. No. 1 stopes in the back of the 145 feet level south produces quartz from 5 to 7 inches wide, which assays 15 dwts. 5 grains per ton. No. 2 stopes in the back of the 145 feet level south produces quartz from 4 inches to 6 inches wide, which assays 10 dwts. 8 grains per ton.—South shaft. The 300 feet level north has been driven 26 feet, total distance 76 feet. Quartz 4 inches wide, assaying 12 grains of gold per ton. The 300 feet level south has been driven 25 feet, total distance 73 feet. Quartz 3 inches wide, assaying 19 grains of gold per ton.—Oriental lode, main shaft. Water is now 25 feet below the 250 feet level, and we hope in the course of another week to drain the 310 feet level.—Surface work. We have completed loading for new winding engine, and are now engaged in erecting new head gear over main shaft.—Health. Good.

**PESTARENA.**—February 3: The 33 fathom level east carries 30 centimetres of lode on hanging wall, but as yet is sterile. The 46 east will soon be in the ore shoot, and already carries a well-defined lode worth 4 tons per fathom at 1 ounce 10 dwts. per ton. At the 55 east some good stones of ore have been met with, but at the present moment the lode is unproductive and extremely wet.—Crosscut. The 46 south from vertical shaft has passed through several small branches of quartz, and is now in fine grained schist. The 70 north from No. 1 lode has intersected a small sterile branch; otherwise no change.—Stopes. Caunter lode. At the 46 a stopes is yielding 2 tons per fathom at 18 dwts., and one at the 55 yields 2 tons at 15 dwts.—No. 1 lode. At the 55 east there are five stopes, yielding an average of 5 tons per fathom at 1 ounce 18 dwts. per ton. At the 70 one stopes, yielding 10 tons per fathom at 2 ounces 10 dwts. On the A and B lodes at the 70 west a stopes is giving 3 tons per fathom at 1 ounce 10 dwts., and another at the 90 on No. 1 lode 3 tons per fathom at 1 ounce. An intermediate drive over the 90 east is producing 3 tons per fathom at 1 ounce, and another over the 100 fathom level 3 tons at 1 ounce.—Stabioli. The ground in the crosscut west from Morgen adit is slightly easier for driving.—Kint. In the Goja adit south the lode shows patches of fine pyrites and small quartz veins all over the face of present end, and two small branches have been intersected. In the Goja adit west the Kint lode is 1-30 metre wide, well-



defined, and mixed with fine pyrites throughout. An end east on the supposed Depaulis lode has been commenced. In the Quarara winze cutting ground for the pump has been completed, and preparations are being made for fixing tackle. The machinery is still all working, although at slightly reduced speed. The transport of mill stone was completed on 31st ult., the weather having been most favourable. The electric plant is completed to the 55 fathom level.—W. Henwood Trelease, T. H. Messa.

**SHEBA.**—The following report has been received from the general manager for the month of December:—Mine: No. 5 level. The west drive was extended a further 7 feet; the west incline shaft sunk 24 feet deeper.—No. 7 level. The east drive continued 18 feet. No. 7 north crosscut extended 9 feet, No. 8 north crosscut extended 15 feet. The low level tunnel continued on the hanging wall a further 55 feet. No. 2 south crosscut from the face driven 7 feet. The main shaft sunk a further 19 feet.—No. 8 level. The intermediate winze B sunk 11 feet further.—No. 9 level. The west drive extended 16 feet and the east 2 feet. Intermediate winze D was commenced on this level, and sunk 24 feet during the month.—No. 11 level. The west end was driven a further 20 feet.—Oriental. The Good Hope shaft was sunk further 14 feet 6 inches to the level of the low level tunnel. On No. 3 level the No. 1 north crosscut was driven 7 feet further; the drive east from it started and driven 6 feet 6 inches, and the east drive from it started and driven 12 feet 6 inches. In the same level the No. 7 north crosscut was extended 8 feet 6 inches. The total amount driven was 187 feet 6 inches, and depth sunk was 92 feet 6 inches.—Stopes. The No. 6 level stope has fallen off considerably in value, and the breaking of rock in it has been stopped for the present, as we have better ore in other parts of the mine. However, we are still milling from this stope, having had a thousand tons or so broken in it for some time past. The underhand stope in No. 8 level west continues to yield splendid ore, which has also been found to extend down to No. 9 level, by sinking a winze through the middle of the stope. The No. 9 level back stope is not quite as rich as it was towards the north, still it contains some rich rock near the hanging wall. The No. 9 level underhand stope is rich. The returns from the plates for the past month show the rock sent to the mill to have been the richest stope for nearly six years.—Development. The improvement reported in the Golden Quarry Deep Level Block, and in the bottom of the Good Hope shaft, has not been maintained. The two inclines are not so good as they were, but No. 9 level still continues rich. We have reached the level of the tunnel with the Good Hope shaft, and discontinued sinking; all speed will now be made to connect the tunnel and shaft. Owing to the continued scarcity of native labour, comparatively little development work has been done, the contractors finding it almost impossible to obtain boys. We have managed to keep up our number of boys required for stopping and surface work, but at considerable expense.—Turbine breaker. This piece of work is finished and presents a very substantial appearance. We now feel that the turbines are safe from damage by future floods, although any great rise in the river will still cause a stoppage whilst the water is high, but we do not think any serious damage can be done.

**TAMWORTH GOLD.**—Under date January 2, Mr. Ballantyne writes:—The ore bins are finished. The timbers for the battery arrived to-day, having taken nine days hauling from near Nettle to the mine. One post weighs 5648 lbs. The great weight of the native timbers makes such work go slowly. With the exception of the battery posts, all the heavy timbers are in place. I do not expect to be able to finish mill until middle of February. As to the saving of fine gold, with our fine screens, good mortars, also the concentrating tables, traps, and riffles, we will be able to save a very high percentage. All that work takes time, and few mills will start as complete in that respect as this company's.

**VICTORY GOLD.**—Mr. Santelli reports under date of January 11 I confirm my cable as follows: "Outcrop London. Recent new reef. First lode Santelli level all containing gold." At this moment all anxiety is over. On January 1 we reached the lode in Santelli level: at the Cantara shaft, and on the evening of the 6th it has been completely traversed. Its width is 240 metres. Its assays which I made by pestal and mortar under mercury gave from  $\frac{1}{2}$  ounce, 2 ounce to  $\frac{1}{4}$  ounce per ton of quartz of 2240 lbs. The gold is fine, but visible. I am continuing driving the level before being able to follow the lode in direction for ventilation. As soon as I can follow the lode in direction I will do so, and this should be before the end of the month, as I cannot yet put on two gangs of miners without interfering with the progress of the level. The progress made during the month of December by the Italian workmen was 57 feet, as you can see from the pav sheet.—New reef. Last evening in a recut which I have made 45 feet from the west drive I cut the lode, which has a thickness of 25 inches at the reef, and tends to become thicker. The pestal and mortar under mercury gave me pretty large gold and fine gold as well from  $\frac{1}{2}$  to  $\frac{1}{4}$  ounce per ton of quartz and rock of 2240 lbs. I shall at once organise a working place for extraction. I have already from my previous work at the new reef 50 tons and more of quartz, which I will have transported on the tramway. We lost nothing by plying the passage of the seven workmen which I brought with me. They have served to bring more men to the mine. I hope that you will be satisfied with the good news which I send, and I hope that I will soon be able to send more convincing proofs.

**WEMMER.**—Report for the month of December.—Profit for the month, £10,698 8s. 5d.—Capital account: New incline main shaft, £376 1s. 7d.; machinery, buildings, and general improvements, £567; total, £943 1s. 7d.—Milling results for December, 1895: Stamps at work, 50 stamps; working time, 29½ days; tons crushed, 6793 tons; tons crushed per head per day, 4.60 tons; bar gold extracted, 4096.27 ounces; yield per ton crushed, 12.06 dwts.; tailings treated, 3375 tons; bullion from tailings, 1003.01 ounces; concentrates caught, 160 tons; assay value of concentrates, 6 ounces 2 dwts. 12 grains.—Note. The total yield per ton, including extraction from tailings and concentrates, is 18.12 dwts. fine gold.

**YERRAKONDA.**—Fortnightly report of Captain M. Scantlebury, mine agent, dated January 22: South shaft. This shaft has been sunk 11 feet 6 inches, now 263 feet from surface. The quartz is 3 feet wide, assaying 5 dwts. of gold to the ton. We have commenced to open north and south on the lode with two drives at the 255 feet level.—Health. This is fairly good.

**DAY DAWN BLOCK AND WYNDHAM.**—Mine manager's report for fortnight ending December 28:—No. 2 underlie shaft sunk 7 feet, total below 16 level 57 feet, or 2214 feet from surface. Reef 4 feet, but broken up at present, and with 18 dwts.—16 level east driven 10 feet, total 127 feet. Reef in face 2½ feet, improving, worth 19 dwts. Hanging wall portion of reef is standing. In the stopes the reef will average 19 feet, worth 10 dwts.—15 level east, No. 5 winze, sunk 12½ feet, total depth 96½ feet, no reef on the wall being sunk on. Day Dawn stope 15 inches, worth 18 dwts. Talisman stope 10 inches, worth 25 dwts.—15 level west. Stopes average 3 feet, worth 10 dwts.—14 level west driven 3½ feet, total length 476½ feet. There is a vein of quartz on the foot, and another on the hanging wall. In the stopes the reef will average 2 feet, worth 16 dwts.—14 level east, intermediate. Reef in the stopes will average 3 feet, worth 25 dwts.—13 level west driven 5 feet, total length 352 feet. Reef averages 18 inches, worth 12 dwts.—11 level west, No. 2 winze, sunk 8½ feet, total depth 178½ feet, with a little rubby quartz in the bottom.—10 level west. Reef in stope 2½ feet, worth 10 dwts. per ton.—3 shaft. The underlie has been sunk 6 feet, total depth from vertical shaft 937 feet. Reef 18 inches, but of no value at present.

**MILLS' DAY DAWN UNITED.**—The following is the report of the mine manager for the fortnight ending December 14: Underlie shaft sunk 9 feet, in depth below No. 10 level 66 feet. 10 level extended 30 feet, total length 135 feet. A leader 6 inches thick of fair quality has made both on hanging wall and footwall, with 2 feet of formation between.—9 level west. In the stope over the level the reef will average 2 feet of fair quality.—8 level west. Footwall level No. 2 winze sunk 24 feet, total depth 36 feet. The stope over the levels average 2 feet 6 inches medium quality, with signs of improvement in western end of the footwall stope.—6 level east

and west. Reef varies from 18 inches to 3 feet of poor stone.—Footwall stope. I have commenced to rise on a shoot of stone 30 feet long, and averaging 2 feet of good quality.

**MYSOORE.**—R. Hancock. Mining operations for the fortnight ending January 20.—Rowse's shaft, 1460 feet level north of crosscut west. There are two stopes in the back of this level, the average width of the lode being 3 feet 3 inches, giving an average assay of 6 dwts. 12 grains.—1360 feet level south of crosscut. There are four stopes in the back of this level, the average width of the lode being 2 feet 1 inch, giving an average assay of 18 dwts. 11 grains.—1360 feet level north of crosscut. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 13 dwts. 4 grains.—1360 feet level north of sump winze. The driving of this level has been resumed in a north-easterly direction. Driven 2 feet, making a total distance driven of 339 feet. The rise in the back of this level has been put up 12 feet 6 inches, making a total height of 38 feet 6 inches. The lode is 3 feet wide, assaying 15 dwts.—1360 feet level south of sump winze. The driving of this level has been resumed. Driven 20 feet 6 inches, making a total distance of 139 feet 6 inches. The lode is 5 feet wide, assaying 13 dwts. 4 grains. There are two stopes in the back of this level, the average width of the lode being 5 feet, giving an average assay of 10 dwts.—1260 feet level north. The rise in the back of this level has been put up 1 foot, making a total height of 29 feet. The lode having become pinched it has been suspended. There are five stopes in this level, the average width of the lode being 3 feet 3 inches, giving an average assay of 18 dwts. 7 grains.—1260 feet level north crosscut. This end has been driven 21 feet 6 inches, making a total distance driven of 43 feet. The lode is 5 feet wide, assaying 1 ounce 10 dwts. The rise in the back at the end of the crosscut has been put up 16 feet, making a total height of 39 feet. The lode is 5 feet wide, assaying 3 ounces.—1260 feet level south of crosscut. This end has been driven 19 feet, making a total distance driven of 45 feet. The lode is 5 feet wide, assaying 1 ounce 15 dwts.—1260 feet level. This level has been driven 2 feet, making a total distance driven of 265 feet. The lode is 6 inches wide; no sample taken. There are three stopes in the back of this level. The average width of the lode being 3 feet 8 inches, giving an average assay of 1 ounce 2 dwts. 9 grains.—1160 feet level north. The lode in the stope in the back of this level is 2 feet wide, assaying 13 dwts. 1 grain.—1160 feet level north of crosscut. This end has been driven 14 feet 6 inches, making a total distance driven of 62 feet. The lode is 5 feet wide, assaying 2 ounces.—1160 feet level south of crosscut. This end has been driven 14 feet, making a total distance driven of 47 feet 6 inches. The lode is 2 feet wide, assaying 1 ounce 10 dwts.—1160 feet level south. The rise in the back of this level has been put up 1 foot 6 inches, making a total height of 145 feet 6 inches, and holed to the old rise, which we have resumed. Risen 10 feet, making a total height of 142 feet from the back of level. The lode is 2 feet wide, assaying 1 ounce 13 dwts. There are five stopes in this level, the average width of the lode being 1 foot 11 inches, giving an average assay of 1 ounce 3 dwts. 4 grains.—North of the crosscut east. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 1 ounce 10 dwts.—1060 feet level, north of No. 2 crosscut. This level has been driven 17 feet 6 inches, making a total distance driven of 286 feet. The lode is 4 feet wide, assaying 1 ounce. The rise in the back of this level has been put up 12 feet 6 inches, making a total height of 65 feet. The lode is 5 feet wide, assaying 3 ounces.—890 feet level north. The lode in the stope in the back of this level is 3 feet wide, assaying 2 ounces.—780 feet level north. The lode in the stope in the back of this level is 2 feet 6 inches wide, assaying 17 dwts.—620 feet level south. There are two stopes in the back of this level, the average width of the lode being 2 feet, giving an average assay of 6 dwts. 12 grains.—Taylor's shaft, 486 feet level north. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 13 dwts. 1 grain.—Crocker's shaft, crosscut west to the 1060. Driven 29 feet 6 inches, making a total distance driven of 44 feet.—890 feet level north. This level has been driven 28 feet, making a total distance driven of 174 feet 6 inches north of the crosscut to Crocker's shaft.—890 feet level south. There are six stopes in the back of this level, the average width of the lode being 4 feet 2 inches, giving an average assay of 1 ounce 1 dwt. 12 grains.—780 feet level north. The lode in the stope in the back of this level is 4 feet wide, assaying 1 ounce.—780 feet level south. There are eight stopes in this level, the average width of the lode being 3 feet 10 inches, giving an average assay of 19 dwts. 12 grains.—620 feet level south. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 6 dwts. 12 grains.—236 feet level north. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 15 dwts.—Gilbert's shaft. This shaft has been sunk 7 feet 6 inches, making a total depth of 139 feet below the 650.—650 feet level north. The driving of this has been resumed, driven 14 feet 9 inches, making a total distance driven of 422 feet 9 inches. The lode is 8 inches wide, mixed, no sample taken.—520 feet level north. There are three stopes in the back of this level, the average width of the lode being 2 feet 1 inch, giving an average assay of 12 dwts. 1 grain.—520 feet level south. The winze in the bottom of this level has been sunk 4 feet 6 inches, making a total depth of 33 feet 6 inches. The lode is 1 foot 6 inches wide, assaying 18 dwts. 6 grains. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 10 dwts.—380 feet level north. The lode in the stope in the bottom of this level is 2 feet wide, assaying 6 dwts. 12 grains.—290 feet level north. There are two stopes in the back of this level, the average width of the lode being 2 feet, giving an average assay of 10 dwts. 2 grains.—180 feet level south. There are two stopes in the back of this level, the average width of the lode being 2 feet 3 inches, giving an average assay of 14 dwts.—Tennant's shaft. 750 feet level north of crosscut west. This level has been driven 14 feet 6 inches, making a total distance driven of 277 feet 6 inches, the lode is 1 foot 8 inches wide, assaying 6 dwts. 12 grains.—360 feet level, south of crosscut. There are two stopes in this level, the average width of the lode being 2 feet, giving an average assay of 10 dwts.—290 feet level south. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 15 dwts.—Schaw's shaft. 450 feet level north of crosscut. There are three stopes in the back of this level, the average width of the lode being 1 foot 1 inch, giving an average assay of 1 ounce 4 dwts.—450 feet level south of crosscut. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 6 dwts. 12 grains.—320 feet level north. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 6 dwts. 12 grains.—McTaggart's shaft. Crosscut west at the 650. This has been driven 3 feet, making a total distance driven of 24 feet. At this point we intersected quartz and have started to drive south on it. Driven 12 feet, the lode is 1 foot wide, assaying 6 dwts. 12 grains.—550 feet level north. This level has been driven 13 feet 9 inches, making a total distance driven of 351 feet 9 inches, the lode is 1 foot wide, assaying 1 ounce.—The winze in the bottom of this level has been sunk 3 feet 3 inches, making a total depth of 12 feet 6 inches. The lode is 9 inches wide, assaying 10 dwts.—550 feet level south of crosscut west. This level has been driven 12 feet, making a total distance driven of 316 feet 3 inches. The lode is 6 inches wide, assaying 13 dwts. 1 grain. The winze in the bottom of this level has been sunk 3 feet 3 inches, making a total depth of 51 feet 9 inches. The lode is 1 foot 3 inches wide, assaying 7 dwts. 3 grains. There are two stopes in the back of this level, the average width of the lode being 1 foot 3 inches, giving an average assay of 9 dwts. 18 grains.—320 feet level south. There are two stopes in the back of this level, the average width of the lode being 2 feet 3 inches, giving an average assay of 8 dwts. 6 grains.—Prospect shaft No. 2. This shaft has been sunk 1 foot 6 inches, making a total depth of 120 feet 6 inches. The sinking is still hindered by water.—Ribbledale's shaft. This shaft has been sunk 7 feet, making a total depth of 29 feet below the 2150. The lode is 2 feet wide, assaying 3 dwts. 22 grains.—2150 feet level north. This level has been driven 14 feet, making a total distance driven of 69 feet. The lode is 9 inches wide, assaying 8 dwts. 22 grains.—1460 reef. We are engaged stripping down this to the size of the shaft.—Crosscut west from the 1060. This has been driven 15 feet, making a total distance driven of 81 feet.—Williams' shaft, crosscut east from the 173. This end has been driven 1 foot 6 inches, making a total distance driven of 179 feet.—Health. Good.

**BONNIE DUNDEE.**—Mine manager's report for the fortnight ending December 28: No. 3 shaft underlie on Victory reef sunk 10 feet, and put in heavy timber for plat. The ground is better near the footwall which is flatter, and a lot of water is coming from the south side of the shaft. No. 1 north level driven 20 feet on rather soft formation. There is no reef at present. Winze sunk 10 feet. After sinking 6 feet a leader 4 inches thick came across the winze underlying north. If this should be a new reef we shall prove it in the level below. Stopes are about the same, but the quality is a little better. The reef appears to be making over the blank.—No. 1 south level. I am pleased to report a reef in the bottom of the winze, 2 feet 6 inches thick, very good stone, so that we shall have something to operate on in the level below.—No. 2 levels north and south. Driven both 5 feet. No change at present in the south, but in the north level there are two veins of mellow stone.

**BRILLIANT BLOCK.**—The mine manager's report: Underlie shaft sunk 9 feet, total below 8 level 51 feet. Formation 3 feet wide with patches of rubby quartz. 8 level east driven a total of 136 feet. Reef 3 feet, 6 to 8 dwts.—7 level east. No. 1 winze 70 feet deep, with a reef in the bottom 2 feet, 6 to 8 dwts. Hanging wall drive extended 11 feet, total 162 feet; no reef; ground hard. Footwall drive total length 314 feet. Reef in face 1 foot, 14 dwts. Stopes vary from 10 inches to 2 feet 6 inches, 9 to 12 dwts. In one stope over footwall drive, reef 9 feet 12 dwts., in the other two the reef is 6 inches to 3 feet, 10 to 12 dwts.—6 level west. In the four stopes reef varies from 1 to 4 feet, 10 to 12 dwts.—6 level east. In one stope reef is 2 feet, 18 dwts.—4 level west. No. 3 winze 80 feet deep. Reef 1 foot, 7 to 10 dwts. Two stopes over reef 2 feet, 10 to 14 dwts.—4 level east. Flat reef 6 inches to 2 feet, 15 dwts.—New mill. This is now nearly completed.

**CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA.**—The following letter has been received from the office in Johannesburg, dated January 17: The routine business of the company is now being carried on as usual, and all the mines have again started work, and are now in full swing. We have reason to hope that sufficient coal supplies will be coming forward, this being our principle anxiety in connection with the resumption of mining operations. Both white and native labour is at present ample for all purposes. There are some individual cases of shortness of labour supply, but generally speaking there is no difficulty on this head. New machinery, &c., will be a long time coming forward, and in this respect there may be some delay in connection with shaft sinking, although every effort will be made to make temporary arrangements so as to minimise this difficulty as much as possible.

**GEM OF CUE.**—Manager's December report: On the 6th inst. I supplied you with information to the following effect:—"Have struck ore body in water shaft at a depth of 105 feet. Quartz contains specks of visible gold." A slight error occurred in above; depth at which ore has been struck should read 109 feet. I have continued this shaft (A) to a depth of 115 feet, cutting through the lode. Have driven along the reef east 8 feet, disclosing a well-defined body of quartz 2 feet thick, in which gold is visible; so far prospects about 1 ounce stone, improving in size and richness in east face. This is a highly important and valuable development. Water is also trickling from the reef. I shall expect a good supply at a further depth of about 30 feet. This work I propose proceeding with forthwith, also continuing the drive on this level for the purpose of obtaining a further insight as to value of ore body.—C shaft. Have continued sinking on underlay. Unsafe nature of ground has necessitated some timbering. Present depth 92 feet.—E shaft. Have been driving along lode to test length of shoot, body of stone, &c. Drive north from 24 feet level is 20 feet along course of lode. Width of lode from 1 foot to 1 foot 6 inches. Reef carrying excellent gold in patches, necessitating sorting the stone. To carry out the wishes of the directors, and push on with main shaft, I deem it advisable to discontinue work at this north shaft for the present. Will, therefore, concentrate labour at water shaft, C shaft, and main shaft. From the above-mentioned north shaft I have been raising ore for crushing, from 25 to 30 tons are now at grass. As local mills are fully engaged for some time to come, this stone cannot be crushed at present. It is impossible to supply any specified time for treatment. The lode will also require still further development to ascertain its value, permanency, &c.—(Signed) Norman Whitelaw.

**GOLDEN DOVE.**—A letter from the manager, dated January 15, states:—Golden Dove, Scot's reef, Michael's reef. A very fair amount of quartz is being obtained from these reefs, and we have a lot of ore at grass ready for the battery. Pannings show free gold throughout in quantities that should prove highly remunerative. The battery will, I expect, be ready for starting crushing by the time this letter reaches you. Have not yet received advice of shipment of stone breaker and pump.—Intermediate hill area. No work at present is being done on this area.—Mar's area. The miner (Taylor), who is prospecting this area, has discovered two new reefs, one 11 feet, and the other 4 feet wide. I panned samples from each of these reefs, the result in each case being very satisfactory. Shall be better able to judge the value of these reefs when shafts are sunk on them. The 11 feet reef runs down to the River Ingobovu, on the one side, about 30 to 40 yards, and can be traced on the other side for a considerable distance. Since being taken over by the company, six new reefs have been discovered on this block; some are narrow on top, but may prove to be wider when developed.

**LYDENBURG (TRANSVAAL) GOLD EXPLORATION.**—A circular issued by the directors states: That the manager arrived on the property about the middle of December. He is now arranging for the erection of quarters for himself and staff. At present, as there is no accommodation nearer than Pilgrim's Rest, he is not able to keep himself in very close touch with the operations of the prospectors, and consequently work is progressing much slower than will be the case when staff quarters on the property have been completed. A prospector was engaged about three months before his arrival, and has been conducting operations on the Elandfontein Farm. On the manager's arrival, the prospector reported to him that he had located reefs, one in the sandstone and one in the dolomite formations, and handed him samples from these reefs. These samples assayed 5 dwts. to 12 dwt. from the dolomite reef, and 18 dwts. to 11 ounces from the sandstone, but the manager reported that these samples were rather small to be considered of fair average value. The Chairman, being at Pilgrim's Rest, accompanied the manager to the property, and they confirmed the prospector's report as to the presence of the reefs reported by him, and average samples were taken by the manager, but on being assayed these gave a much lower assay value in the sandstone reef, but seemed to indicate that the Dolomite reef was of a steady value. Since then the directors have had the following from the manager, dated January 17:—Last week prospector brought two samples of ore, one from the Dolomite reef and one from the Sandstone reef. As he is driving on these, he is consequently further in than when I took samples. The sample from the Dolomite reef assays 18 dwts. per ton, and the Sandstone reef assays 7 dwts. 4 grains per ton. As these samples have been taken by prospector, and although larger than his original samples, and consequently more suitable, I hesitate to put too much confidence on the results. I hope to visit property next week, and will take the opportunity of checking these results by taking samples for myself. The old workings in the Dolomite, of which you have sample and assay value, I am leaving alone for the present, so far as development is concerned, as it is at a considerable distance from where prospector is at present working, and would entail considerable expense, which we might be able to lessen by judicious arrangement after we get settled on the property. I have secured the services of a second prospector; he is directing operations on the Sandstone reef, and the other is driving on the Dolomite reef, the two reefs being at such a distance apart, that one man could not supervise the Kaffirs on both, without considerable inconvenience. With reference to boring plant, my opinion has altered somewhat since I first wrote to you. At that time I had not been on the ground, and had merely the prospector's report. Since then, having visited the ground, and found that we have two reefs which assay favourably, the dolomite being fairly regular, I am of opinion that it would be more judicious, for some time, at least, to develop



those reefs, and by engaging practical miners for that purpose, and allowing the prospectors to go all over surface prospecting, we may get sufficient to warrant our starting operations in a small way, until our knowledge of the whole property is fuller and more definite than it is at present. Again, we have, as you are already aware, a reef in the sandstone, and this sandstone, according to all information which I have already gained, is supposed to be not more than 200 feet thick, and underlying the sandstone is supposed to be about 300 feet of lower dolomite and shales resting on top of the granite, so that our deepest bore in order to prove the section of strata, which we cannot prove by surface prospecting, is not likely to exceed 500-600 feet. This depth of bore could be accomplished by a hand diamond drill, and thus save steam power. Of course, by my opinion in this matter might again undergo a change after having visited the farms of Notgedacht and California on the west side of the Orghelstad river, but as it is quite impossible for us to begin operations there until we are on the property and have become more familiar with all the farms, it will be some time before I can definitely state whether deeper borings than I have already indicated would be necessary, but we might by that time be able to hire a boring machine from a neighbouring property. I am thoroughly of the opinion at present that it would be judicious to delay purchase of such large boring plant for our company for some time at least. Had we found no reefs on the property I should have had no hesitation in adhering to my original opinion of beginning boring at once, but since we have something to work on and develop, we are in a position to make definite progress apart from boring in the meantime. As time goes on I will be in a position to give you fuller information with regard to these matters.

**LISBON BERLYN.**—The manager's advice give the following details of work done during December:—Mining. Theta north, driven 102 feet; size of reef, 10 inches; output, 441 tons; average assay, 9 dwts. Theta south, driven 214 feet; size of reef, 15 inches; output, 615 tons; average assay, 10.9 dwts. Theta, mill section, driven 57 feet; size of reef, 10 inches; output, 32 tons; average assay, 8 dwts. Theta, No. 2 section, driven 93 feet; size of reef, 17 inches; output, 95 tons; average assay, 5 dwts.—Milling. This mill ran (10 stamps) 24-25 days, and crushed 718 tons ore of an average assay value of 9.6 dwts. per ton, yielding 48.18 ounces of smelted bullion.—Cyaniding. 418 tons of ore and fines, and 745 tons of tailings were put into the vats during the month. 880 tons were cleaned up, yielding 605.80 ounces smelted bullion. Total bullion recovered 653.98 ounces, of an approximate value of £1349.—Native labour. The outlook is improving. We have had a large addition during the last fortnight in December.—Note. Under date of January 17 manager says, in reference to native labour:—"We have now a good supply, and good progress is being made in mining and development."

**MAY CONSOLIDATED.**—The directors submit the following report for the month of December: Battery. 100 stamps ran 27½ days, crushed 11,000 tons. Gold won, 3656.08 ounces (average 6.67 dwts. per ton), valued at 72s. 6d. per ounce, £13,253 5s. 10d.—Cyanide works. Siemens' process. 7200 tons tailings treated. Bullion won 1643 ounces, equal to (say) 1232 ounces fine gold (average 3.42 dwts. fine gold per ton, at 80s. per ounce, £4928. Other receipts, £47; total, 18,228 5s. 10d.—Working costs. Mining, 11,000 tons, cost £1762 10s. 11d., equals 15s. 0.274d. per ton; development, 11,000 tons, cost £1355 9s. 8d., equals 2s. 5.574d. per ton—£3518 0s. 7d., equals 15s. 5.848d. per ton. Trammings, 11,000 tons, cost £367 0s. 4d., equals 8.008d. per ton; crushing and sorting, 11,000 tons, cost £296 19s. 6d., equals 6.479d. per ton; milling, 11,000 tons, cost £2065 9d. 1d., equals 3s. 9.064d. per ton—£11,247 9s. 6d., equals 20s. 5.399d. per ton.—Tailings treatment. Siemens' process. 7200 tons cost £1010 7s. 9d., equals 2s. 9.674d. per ton; total, £12,257 17s. 3d. Profit, £5970 8s. 7d.—Expenditure on capital account. Construction, &c., £4172 7s. 8d.; excess development, £571 19s. 2d.; total, £4744 6s. 10d.

**MOUNT ROWE CONSOLIDATED.**—The manager, under date of January 8, reports as follows: During the exemption there is a total suspension of all underground labour on the leases. The erection of the oil engine is now completed, and the head gear is about completed. As soon as this is done I propose to concentrate all labour on the Mount Rowe leases on this shaft to sink for water to drive along the reef, and also to crescent east. I am of opinion we shall soon find some very good ore. I am about to erect a condensing plant to condense water from the Richmond shaft. This will make us quite independent, and will place us in a better position for securing labour. I hope shortly to be able to forward important news. I am pleased to say the extreme heat of the last three weeks has broken up with a shower of rain to day.

**MYSOKE.**—A letter has just been received from the superintendent at the mines, stating that for the past two months or more the "clean ups" have been of such a satisfactory character that, over and above the increased return, there is an accumulation to the end of January of about 7000 ounces of gold of the estimated value of about £27,000. This gold was not added to the production in the usual way, because the superintendent considered it advisable to keep back a portion of the produce in order to provide against fluctuations in the returns from unexpected causes. The large number of levels, rises, and winzes upon "Crocker's Chute," and the high quality of the quartz coming from the same have, however, caused such a rapid accumulation, that he felt it his duty to inform the directors of the position. The board in their turn wish to inform the shareholder that they have now requested the superintendent to send the gold to England, and at the same time to avoid so large an accumulation in the future. It is only fair to the superintendent to state that, in the opinion of the board, his position in the matter has been a somewhat difficult one, and that his sole object has been to prevent violent fluctuations in the monthly results. The directors desire me to say that in view of the exceedingly satisfactory manner in which the mines have been opening up of late, especially upon "Crocker's chute," they have decided to order and send out without delay a new 30 stamp battery to take the place of the old 30 stamp mill. They have also under consideration the renovation of the other mills, with a view to increased efficiency and reduction of working expenses. A portion of the surplus of gold referred to will be devoted to the above, and the balance to the general purposes of the company.

**TRUE BLUE (Hannan's).**—Superintendent's report for fortnight ending January 4: No. 1 main shaft. The contractors have sunk a further depth of 30 feet, total distance from sill 96 feet. This week a depth of 100 feet will be reached when I shall invite tenders for driving the crosscuts at this level.—Underlie shaft. The contractors have sunk the underlie dipping to the east a further distance of 7 feet, total distance sunk on the eastern incline, 20 feet, with no improvement on the last fortnightly report. A thin vein branched off into the footwall. I brought the contractors back and sunk here a depth of 18 feet from the footwall, the panning during the sinking gave only a trace of gold, from the bottom I sent 1 cwt. of stuff to the assayer and obtained a return of 1 dwt. 7 grains to the ton. I have discontinued all work in the underlie below the intermediate level.—Intermediate level. Contract has been let for extending this level 100 feet south-east and contractors commenced work.—Jubilee section. The contractors have sunk the shaft a further depth of 3 feet, total depth from base 101 feet, the shaft is now in the hard diorite, —50 feet level. The contractors have extended this level a further distance of 12 feet, making total distance 44 feet with no change to report. All work done by me on this section up to the time of writing points to the conclusion that the strong, rich lode reported to exist in these workings consists of a surface deposit of about 250 tons. I have been prospecting in shaft B on a vein about 9 inches in thickness, which carries gold, and shall next week open out on this vein and further prospect it, results from which will be duly reported.—Surface. The erection of buildings on the surface is now finished.

Mr. C. J. ALFORD, of the well-known firm of Messrs. Bewick, Moreing, and Co., is about to proceed to Australia and New Zealand, and eventually to British Columbia, on behalf of a syndicate.

## EXPORT AND IMPORT TRADE.

THE BOARD OF TRADE RETURNS—JANUARY  
TABULAR STATEMENT.

Specially compiled for "The Mining Journal" from the Board of Trade Returns.

THE Imports amounted to £38,473,856, against £36,743,481 for January, 1895; an increase of £1,730,375. The exports of British and Irish Produce and Manufactures amounted to £21,127,168, against £18,224,226 for the same month last year; an increase of £2,902,932. The exports of Foreign and Colonial Merchandise show an increase of £938,449; the figures being—January, 1896, £4,825,707; January, 1895, £3,887,258.

## EXPORTS:—SUMMARY OF INCREASES AND DECREASES.

PRINCIPAL AND OTHER ARTICLES	QUANTITIES.		VALUES.	
	INCREASE.	DECREASE.	INCREASE.	DECREASE.
Raw Materials:				
Coal and Patent Fuel ... Tons	593,081	—	183,674	—
Coal, &c., shipped for steamers' use ... Tons	119,513	—	—	—
Metals:				
Brass, and manufactures of	2,125	—	10,844	—
Copper, unwrought and wrought ... Cwts.	8,038	—	36,658	—
Hardware and cutlery ... £	—	—	31,302	—
Impurities and tools, and parts thereof ... £	—	—	19,502	—
Iron, unwrought and wrought ... Tons	6,396	—	364,986	—
Lead, pig, rolled, &c. ... Tons	780	—	13,374	—
Plate, and plated gilt wares &c. ... £	—	—	11,008	—
Telegraph wires, &c. ... £	—	—	22,031	—
Tin, unwrought ... Cwts.	—	423	—	2,380
Zinc or Spelter ... Tons	5,665	—	3,052	—
Other Articles ... £	—	—	14,259	—
Total ...	—	—	525,236	—
Machinery:				
Steam engines ...	—	—	58,320	—
Other descriptions ...	—	—	156,778	—
Total ...	—	—	214,998	—
Alkali ... Cwts.	—	31,038	—	9,175
Cement ... Tons	—	3,981	—	5,952
Products of Coal ... £	—	—	32,892	—

## EXPORTS:—BRITISH AND IRISH PRODUCE.

PRINCIPAL AND OTHER ARTICLES	QUANTITIES.		VALUES.	
	Month ended Jan. 31.	Month ended Jan. 31.	1895.	1896.
Metals and Articles Manufactured therefrom (except Machinery):				
Brass, and Manufactures of, not being Ordnance ...	7,905	10,331	33,587	41,431
Copper: Unwrought, in Ingots, Cakes, or Slabs, and Precipitate:				
To Germany ...	4,017	7,091	7,727	16,679
"Holland ...	7,586	12,325	15,269	28,580
"Belgium ...	2,415	5,210	5,093	12,144
"France ...	20,422	8,837	43,508	21,073
"Italy ...	1,820	—	4,099	—
"British East Indies ...	88	60	194	149
"Other countries ...	3,739	5,709	5,506	13,505
Total ...	40,027	39,232	85,094	92,139
Wrought, or Manufactures, unenumerated:				
To Sweden and Norway ...	354	1,423	1,260	4,433
"Germany ...	127	238	483	901
"Turkey ...	5,995	2,034	15,814	5,763
"Egypt ...	1,090	3,068	2,879	8,335
"Brazil ...	3,759	1,450	10,397	4,156
"British East Indies ...	12,779	19,943	30,439	50,820
"Australasia ...	598	1,474	1,924	4,525
"Other countries ...	5,672	11,932	16,441	32,533
Total ...	30,405	41,560	79,857	111,476
Mixed or Yellow Metal:				
To China and Hong Kong ...	212	1,805	461	4,281
"British East Indies ...	21,820	16,994	43,855	38,141
"Other countries ...	3,658	4,477	5,728	10,599
Total ...	25,690	23,276	50,044	53,021
Total of Copper ...	66,126	104,158	217,975	254,639

Hardware and Cutlery ...	—	—	49,617	181,519
Impurities and Tools, and parts thereof ...	—	—	97,593	117,095
Iron and Steel: Pig iron:				
To Sweden ...	606	358	1,440	1,143
"Denmark ...	297	4,336	654	7,899
"Sweden and Norway ...	1,189	720	2,330	1,360
"Germany ...	1,696	4,406	3,779	12,059
"Belgium ...	4,960	7,293	12,225	15,048
"France ...	2,980	2,794	8,825	12,399
"Portugal, Azores, & Madeira ...	3,043	2,129	5,689	6,714
"Spain and Canaries ...	1,602	840	2,845	3,705
"Italy ...	2,683	261	6,003	1,011
"United States ...	5,444	6,058	13,063	11,683
"Australasia ...	761	4,723	4,099	26,715
"British North America ...	1,176	1,470	2,669	3,718
"Other countries ...	6,078	10,274	16,170	25,399
Total ...	35,677	47,665	82,154	135,390

Bar, angle, bolt, and rod ...	10,578	13,273	64,470	84,010
Railroad of all sorts ...	24,283	45,665	104,822	211,303
Wire, iron and steel &c. ...	3,277	4,187	54,329	64,397
Hoops, plates, boiler plates, &c. ...	6,612	6,073	59,492	62,765
Galvanised sheets ...	13,652	19,022	147,517	220,339
Cast and wrought iron, &c. ...	24,086	32,241	307,399	389,801
Old, for re-manufacture ...	4,599	9,679	11,561	24,686
Steel, unwrought ...	10,418	21,306	107,648	191,733
Black plates for tinning ...	3,826	3,269	39,961	30,730
Manufactures of steel, or of iron and steel combined ...	823	1,626	31,716	52,020
Total of iron and steel (including tin plates and sheets) ...	166,711	227,607	1,351,068	1,716,072
Tin Plates and Sheets:				
To Russia ...	1,627	25	19,615	261
"Germany ...	380	514	4,835	6,673
"Holland ...	282	424	4,678	5,642
"France ...	1,075	1,124	13,263	12,545
"Portugal, Azores, and Madeira ...	251	491	3,101	5,964
"Italy ...	428	170	5,082	4,399
"Roumania ...	—	13	—	148
"United States ...	18,616	11,931	216,168	134,276
"Brazil ...	557	551	6,130	5,714
"Argentine Republic ...	181	995	2,150	11,093
"British East Indies ...	962	1,932	11,592	21,873
"Australasia ...	690	1,602	8,164	20,094
"British North America ...	827	2,986	10,889	11,100
"Other countries ...	3,478	2,353	41,393	27,678
Total ...	29,538	23,461	347,047	269,368

Lead: Pig Sheet, Piping, and Manufactures:				
To Russia ...	90	152	192	1,864
"Germany ...	128	10	1,345	131
"China and Hong Kong ...	304	627	3,013	2,284
"Japan ...	243	434	3,328	5,697
"United States ...	262	5,818	5,818	—
"British East Indies ...	802	1,199	12,168	17,560
"Australasia ...	61	67	673	957
"British North America ...	36	85	369	1,046
"Other countries ...	601	803	6,871	10,029
Total ...	1,577	3,207	31,194	44,569

## BRITISH AND IRISH PRODUCE—Continued.

PRINCIPAL AND OTHER ARTICLES	QUANTITIES.		VALUES.	
	Month ended Jan. 21.	Month ended Jan. 31.	1895.	1896.
Plate and Plated & Gilt Wares: Telegraphic Wires, & apparatus connected therewith ...	—	—	19,372	30,380
Tin, Unwrought:				
To Russia ...	1,746	1,404	5,692	4,544
"Sweden and Norway ...	529	219	1,707	1,094
"Germany ...	651	220	2,097	1,949
"France ...	1,919	1,323	6,345	4,169
"Turkey ...	1,177	840	3,925	2,739
"United States ...	100	21	334	67
"British North America ...	876	354	2,856	1,161
"Other countries ...	3,680	5,394	17,742	17,624
Total ...	10,678	10,255	35,673	33,293

Zinc or Spelter: Unwrought and Wrought ...	14,207	19,772	9,295	12,347
Total of Principal Articles ...	—	—	1,977,585	2,468,562
Other Articles ...	—	—	56,013	70,272
Total of Metals and Articles Manufactured therefrom (except Machinery) ...	—	—	2,033,598	2,538,834
Alkali ...	501,505	469,467	140,368	111,193
Cement ...	24,593	20,612	39,630	33,578
Products of coal (including paraffin, petroleum, &c.) ...	—	—	144,903	177,795

## MACHINERY.

Mining: (Not Steam Engines):				
To Countries in Europe ...	Jan. 1895	Jan. 1896	Year 1894	Year 1895
"United States ...	£1,591	£2,454	£29,355	£25,557
"Countries in South America ...	62	1,192	5,585	—
"British Possessions in S. Africa ...	2,654	4,492	24,227	29,145
"East Indies ...	30,007	49,693	237,434	487,610
"Australasia ...	2,75	4,668	49,190	39,477
"Other Countries ...	3,811	21,245	12,270	86,265
Total ...	3,314	3,767	32,684	49,316
Total of Machinery other than Steam Engines ...	941,141	1,067,919	11,140,112	12,426,143
Total of Steam Engines ...	100,276	238,496	3,065,103	2,788,967
Total of Machinery and Mill Work ...	£1,121,417	£1,306,415	£14,205,215	£15,215,110

## EXPORTS OF FOREIGN AND COLONIAL MERCHANDISE.

PRINCIPAL ARTICLES.	QUANTITIES.		VALUES.	
	Month ended Jan. 31.	Month ended Jan. 31.	1895.	1896.
Copper:				
Unwrought and part wrought	845	417	37,468	19,644
Iron and Steel:				
Bar, angle, bolt, and rod	1,85	2,823	15,202	24,156
Steel, unwrought	693	763	5,597	5,946
Manufactures:				
Girders, beams, and pillars	7	82	36	328
Unenumerated	44,209	80,774	30,781	47,430
Petroleum ...	111,000	177,000	4,124	5,917
Quicksilver ...	181,810	280,300	15,500	26,097
Saltpetre ...	1,334	1,454	1,144	1,552
Tin, in blocks, ingots, bars, or slabs	16,577	40,641	51,818	126,291

## IMPORTS.

## SUMMARY OF INCREASES AND DECREASES.

PRINCIPAL AND OTHER ARTICLES.	QUANTITIES.		VALUE.	
	Increase.	Decrease.	Increase.	Decrease.
<b>Metals:</b>				
COPPER: Ore ... Tons	—	3,186	£	£
Regulus ...	1,339	—	92,720	48,310
Unwrought and part wrought ...	—	500	—	16,307
IRON: Ore ... "	189,628	—	141,832	—
Bar ... "	1,774	—	14,719	—
Steel, unwrought ... "	432	—	4,157	—
LEAD: Pig and sheet ... "	—	2,163	—	4,692
Pyrites of iron or copper ... "	4,751	—	6,793	—
QUICKSILVER ... Lbs.	—	36,690	—	2,737
SILVER ORE ... "	—	—	—	96,608
TIN, in blocks, &c. ... Cwts.	—	12,516	—	44,454
ZINC, crude ... Tons	1,507	—	23,108	—
OTHER ARTICLES ... "	—	—	6,562	—
			295,681	215,100
			215,100	—
<b>Total</b> ...	—	—	60,791	—
<b>Chemicals:</b>				
ALKALI ... Cwts.	—	6,555	—	5,392
BRIMSTONE ... "	5,667	—	7.7	—
SALTPETRE ... "	—	6,029	—	4,688
<b>Iron Manufactures:</b>				
Beams, girders, &c. ... Tons	2,104	—	13,632	—
Unenumerated ... Cwts.	104,577	—	70,929	—
ZINC MANUFACTURES ... "	10,374	—	8,811	—



## THE INSTITUTION OF CIVIL ENGINEERS.

(FROM A CORRESPONDENT).

At the ordinary meeting, on Tuesday, February 11, Sir BENJAMIN BAKER, K.C.M.G., the President, in the chair, the paper read was on "The Manufacture of Aluminium by Electrolysis, and the Plant at Niagara for its Extraction," by Mr. Alfred E. Hunt, M. Inst. C.E.

The author, after briefly stating the situation of the Pittsburgh Reduction Company's works, and of those of the Niagara Falls Power Company, described the ores of aluminium best fitted for electrolytic reduction to the metallic state, and gave an account of the general principles governing the extraction of the metal from its compounds.

The Hall process, which was that adopted by the Pittsburgh Reduction Company, involved the direct electrolysis of the sesquioxide of aluminium, dissolved in a molten bath of the mixed fluorides of aluminium, calcium, and sodium: 1 cubic foot of the solvent would serve for an hourly production of 1 lb. of metallic aluminium, the bath used being capable of dissolving one-third of its own weight of alumina. The electrical energy required for extracting this amount of metal was 3730 watt-hours for the decomposition of the alumina, with a further supply to maintain the bath at the temperature necessary for the molten condition. The fluorides remained unchanged, so that the operation was continuous. The bath was made either from a mixture of fluor spar and cryolite, or from the artificial fluorides; and it might be fused in a separate vessel when starting work, or in the bath by the current itself. Alumina was added at frequent intervals to prevent too great a variation in the resistance of the bath, and the aluminium, as it was produced, was syphoned from beneath the layer of fluoride, where it collected, without interference with the progress of the operations. The oxygen of the alumina was liberated at the carbon anode, which, at the temperature of the bath (980° C.) oxidised to carbon monoxide. Outside the bath this was burnt at once to carbon dioxide, and was allowed to escape into the working apartment. The carbon anodes were consumed at nearly the same rate as the aluminium was produced, the amount being about two-thirds of the quantity actually used. The difference of potentials theoretically necessary for the separation of the constituents of alumina was about 2.8 volts, but a greater difference was due to the resistance of the bath. The pots employed were of iron with carbon linings, but these could be dispensed with if a high degree of purity was not required.

The chief impurities in the finished product were silicon and iron. These were derived from the alumina as well as from the carbon anodes. Aluminium could be produced containing 99½ per cent. of the pure metal, and was regularly delivered with 99 per cent. The electrolytic baths were joined in series, the positive bar of the switch-board being joined to the carbon anode of one of the baths, and the last pot of the series being joined to the negative bar of the switch-board. All the copper connections were necessarily very heavy, on account of the large currents employed. The sources of the loss of energy were enumerated, as well as the requirements to be met by a suitable solvent and the ore for use in the Hall process.

The electrical energy was generated at the works of the Niagara Falls Power Company, and was conveyed, without the intervention of transformers, over a distance of about ½ mile, by stranded copper cables 1½ inch in diameter. The loss in transmission was about 1½ per cent. of the energy conveyed. The cables were carried in a subway, 5 feet 6 inches high, and 3 feet 10 inches wide, formed of concrete with masonry protection, and with a wooden floor. The two circuits were kept distinct and were connected at the further end by a switch-board to step-down transformers. These were arranged in sets of two, of which the secondary coils were in circuit with one commutating machine or motor generator, the entire set of three machines dealing with 500 horse power. The transformers were of the ordinary type, with closed magnetic circuit, and gave an efficiency of 97 per cent. on full load. They reduced the potential of the secondary circuit to 115 volts. The conductors from the low potential side of the transformers were formed of 4 inch by ½ inch copper bars, insulated on slate slabs. They connected the two transformers with the 20-pole motor generator, driven by the two quarter-phase currents at 150 revolutions per minute, and producing a continuous current of 2500 amperes, by means of a second and independent winding on a commutator on its armature. The currents from the motor generators were joined in parallel to large "omnibus" bars passing directly from a switch board to the reduction pots. The author discussed the methods of measurement for a basis of charge for the energy supplied.

At the New Kensington works of the Pittsburgh Reduction Company the dynamos were driven by steam power. The best steam coal cost only 6s. 3d. per ton at the stoke-holds, and evaporated 10 lbs. of water per lb. of coal at 100° C. in actual practice. Natural gas was obtainable at even a lower equivalent rate during part of the year, when it was used instead of coal.

At the works of the Niagara Falls Power Company, water was taken through a canal, 188 feet wide and 12 feet deep, from the Niagara River, on the United States side, and at a point about ½ mile above the celebrated Falls. It was then conducted by vertical iron pipes, 7 feet 6 inches in diameter, to the turbines, at present three in number, of 5000 horse power each. These were placed at the bottom of a pit, which it was intended ultimately to enlarge so as to accommodate 10 turbines. The flow of the water was controlled by gates and penstocks, placed at the top of the vertical pipes. The turbines were of the Fourneyron type, with two wheels each, and with buckets divided into three tiers. The axes were vertical, and the centre line of the case, midway between the two wheels, was 136 feet below the level of the water in the canal. The speed was controlled by external annular gates, by which the buckets could be partially or wholly throttled. The turbines discharged into a tunnel of horse shoe section, 21 feet high, 18 feet 10 inches wide at its upper portion, and 14 feet 9 inches on the floor. It was about 9500 feet in length, the average gradient being 36 feet per mile, and it was expected to give a velocity of discharge of 26 feet 6 inches per second, and to have a capacity as a tail-race to turbines developing 100,000 horse power.

The 5000 horse power turbines had vertical shafts, carried up to the surface without the intervention of gearing between the bucket wheels and the dynamos. The weight of each of the shafts and of the machinery attached to it amounted to about 152,000 lbs. The load was supported as far as possible upon the disc of the upper bucket wheel by arranging it as the top cover to the case of the guide wheels, the disc of the lower bucket-wheel being at the same time shielded from the pressure of the water. The resultant end pressure, when the load was light, therefore, amounted to about 2000 lbs. upwards; but when the load was increased the upward pressure diminished slightly, and became a downward one of the same amount at full load. These variable resultant pressures were taken up by water-cooled thrust-blocks, arranged on the shaft. The latter

was 11 inches in diameter at its journals, where it was solid, and 3 feet 2 inches at its intermediate portions, where it consisted of a steel tube. The turbines were arranged to deal with 430 cubic feet of water per second, and to develop 5000 horse power, with an efficiency of 75 per cent. Their normal speed was 250 revolutions per minute. Each turbine drove a single dynamo, built upon a heavy masonry arch thrown across the top of the turbine-pit. The field magnets revolved, and the armature was arranged wholly within the revolving field magnet system. There were 12 pole-pieces mounted within a nickel-steel ring 4½ inches thick, 4 feet 3 inches high, and 11 feet 6 inches in diameter. The field magnets were excited by a continuous current, representing 0.2 per cent. of the energy developed by the machine. The armature was built on the outside of a large annular foundation casting, and was entirely wound with ½ inch by 1½ inch copper strips placed in pairs in grooves made in the core, and insulated by mica. The winding was arranged to give two separate but similar alternating currents, each with 25 complete cycles per second, and with a maximum difference of potential of 2500 volts. The two currents differed in phase by an angle of 90°. The efficiency of the machines was 97½ per cent.

In an appendix a detailed account was given of the several ores of aluminium.

## PROVINCIAL SHARE MARKETS.

## THE CORNISH MINE SHARE MARKET.

Mr. MICHAEL WILLIAMS BAYDEN, Mining and Assaying Offices, Liskeard, Cornwall, writes (February 13):—The mining market shows a little more firmness, with occasional buyers of some of the leading mine shares at present unprecedentedly low prices, tin being firmer, and the sale on Tuesday more satisfactory than several previously. Quotations:—Basset United (fully paid), 1 to 1½; Blue Hills (call paid), ½ to ¾; Devon Consols, 20s. to 21s. 6d.; Dolcoath (fully paid), 18s. to 17s.; ditto (partly paid), 4s. 6d. to 5s.; East Pool, 3s. to 2½; Killfret, 6s. to 6s. 6d.; Levant, 3½ to 4; Polberro, 9s. to 10s.; Tincroft, ½ to 1; West Kitty, 2 to 2½; Wheal Grenville, 7 to 7½; Wheal Kitty, 1s. 6d. to 2s.

Messrs. ABBOTT AND WICKETT, Stock and Share Brokers and Mining Share Dealers, Redruth, write under date of January 13:—The market continues stagnant, and until the dispute between Wheal Agar and East Pool has been arranged, and also the question of damaged land at South Frances, it is not probable that shares will command much attention.

## MANCHESTER.

Messrs. JOSEPH R. and W. P. BAINES, Stock and Share Brokers, Queen's Chambers, 7, Market-street, write, February 13 (noon):—Up to the beginning of the settlement now in progress prices in most departments showed advances all round in majority, but with the arrangement of the accounting taking attention, and some inclination to take profits, figures have gone something off the best in the last two or three days. The little set-backs, notwithstanding enhanced figures, are far more numerous still for the week than the declines. Consols lead the way with further advance of ½. Colonials, not, however, all moved upward, but Home Corporation stocks show only advances where altered. Foreigners rather irregular, but changes only range between ¼ and ½ on either side. In home rails Caledonian undivided, which are 1, Chatham ordinary 1.16 to 3.16, and London and North-Western ¼ to ½ down, are the only exceptions to the general rule of higher figures. In Canadian, Pacifics are ½ better, but Trunk issues are lower fractionally all round. Mexican rails lower on Ordinary and First Preference, the Second Preference being nominally unchanged. Americans are mostly lower on balance; best figures reached early on Tuesday last not having been maintained. At one time nearly all issues showed ahead of last Thursday's prices, but the later slip away has wiped out the gains, and put the balance of change on the wrong side for holders. Louisvilles and Milwaukee, after having been distinctly higher, finish with advances of ½ and \$1 respectively, and New York Central keep a rise of ½. Atchison issues also showing small gains for the week. On Friday last the Midland Railway dividend was announced at 6d. against 5d., and this, not being quite so good as had been anticipated, broke their issues about ½, and some other home rails, fractionally. Canadians and Americans, showed some little ease. Attention was directed to South African mines, &c., and Chartereds came on for brisk demand at advancing prices. Saturday not much doing, but home rails evinced a little harder tendency. Nothing much of moment in other rails. South Africans again enquired for, the demand broadening out somewhat. On Monday home rails continued firm, with, however, some little exceptions in Metropolitan Districts and Sheffield A. Americans begun well, and maintained advance up to the finish. In Canadian, Trunk issues hardened up a little. Demand for South Africans continued, and further good advances established. Tuesday was carrying-over day in markets other than mines (mines having been done the day before), and in home rails figures only changed to about amount of Contangoes. Nothing of consequence in other rails; rise of ½ in Canadian Pacifics, and fall of about ½ in Rendings and Union Pacifics, being the only changes worth naming. Yesterday home rails were favourably influenced by the good array of traffics. Americans eased off, as also did Canadians. South Africans, too, fell away in most cases apparently on sales to catch profits on the recent rapid rise. This morning home rails open much as per last night's close, and so do Americans, there being no prices to hand this morning owing to yesterday's holiday in New York. Tone of the markets for the several sections of the miscellaneous market still good. With here and there individual exceptions all classes furnish a goodly list of better values. Hereunder are details of the changes herein for the week:—

CONSOLS.—Higher: Two and Three-Quarter per Cent., ½. COLONIAL STOCKS, &c.—Higher: Cape of Good Hope Registered, 1; New South Wales Inscribed, ½.—Lower: Cape of Good Hope Inscribed, 1.

CORPORATION STOCKS AND DEBENTURES.—Higher: Birmingham Three per Cent., ½; Blackburn Three and a-Half per Cent., 1½; ditto, Three per Cent., ½; Liverpool Three and a-Half per Cent., ½; Manchester Three per Cent., 1; Nottingham Three per Cent., ½.

FOREIGNERS.—Higher: Spanish Four per Cent., ½; Turks Converted "D," ½.—Lower: Argentine Six per Cent., ½; ditto, Five per Cent., ½; Italian Rentes, ½; Uruguay Three and a-Half per Cent., ½.

BANKS.—Higher: Imperial Ottoman, 1 to 1½; London and Midland, ½; Manchester and Liverpool District, ½; National Provincial, ½; Oldham J. S. Bank, ½; Parr's, 1; W. D., and Manchester and Salford, ½.—Lower: Bank of Liverpool, ½.

INSURANCE.—Higher: British and Foreign Marine, ½; National Boiler, ½ to 1; Thames and Mersey Marine, ½.—Lower: Reliance Marine, 1.16; Royal, ½ to ¾.

COAL, IRON, &c.—Higher: Bolckow Vaughan (£20 paid), ½; ditto (£12 paid), 3.16 to 3; John Brown, ½; Cammells, 2½; Andrew Knowles, ½; Sheepbridge A., ½; Tredegar A., 1.16.—Lower: Bolckow Vaughan pref., ½; Ebbw Vale, ½.

TELEGRAPHS AND TELEPHONES.—Higher: Direct United States Cable, ½.—Lower: Western and Brazilian, ½.

BREWRIES.—Higher: Allsopp's, ½; Clarkson's, ½; Guinness, 30; Manchester, ½; Showells, ½; Taylors, ½ to ¾.

MISCELLANEOUS.—Higher: Armitage's, ½ to 1; Bovril, ½; Brunner Mond, ½; Bryant and May, ½; Earle's, ½; Hetherington's, ½; Kellner Partridge, ½; Manchester Carriage Company, ½; Pacific Steam, ½; Rylands and Sons, ½; United Alkali, ½; Whit-

worth's, ½; Gas Light A., 3; Ship Canal Preference, 1.16 to 1½; See Canal, 2.—Lower: Bell's Asbestos, ½; Coats, ½; Manchester Palaces, 6d.; Salt Union, 1.16; Northern Assets, 6d.

LATER (4.0 p.m.).—Home rails keep good. In some instances where quotations are to-day ex div. a fair proportion of the dividend payment has been put on in price, and others have moved very similarly. Americans rather better late this afternoon, as also are Canadians, but on neither has much business been recorded. South Africans have been on the "easy" side all day.

## SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, Stockbroker and Ironbroker (February 13), writes:—During the past week there has been a fair amount of business doing. The principal feature is an advance in South Africans, owing to the favourable impression caused by Mr. Chamberlain's despatch on Transvaal affairs and the Queen's Speech on the opening of Parliament. Good Board of Trade returns, and the upward tendency in the metal markets, have also helped prices.

In shares of coal, iron, and steel companies prices are irregular. Fifeshire Main Collieries lower on statements that the trustees for the debenture holders have taken possession of the property. Bolckow Vaughan are at 15½, Cairnstable 9½, Marbella, 47s. 6d., and Steel Company of Scotland, 94s. 6d.

In shares of copper concerns there is very little alteration to notice. Arizona are at 46s. 6d. ex div., Tinto have improved from 17½ to 18½, and Tharsis from 100s. 6d. to 102s.

In shares of gold and silver mines there has been considerable business doing at higher prices, owing to the more peaceful prospects in the Transvaal. Chartered touched 5½. Consolidated 13½, De Beers 26½, East Rand 7½, Johannesburg Investment 90s., and Randfontein 65s., but are all easier on realisations. Sheba have also been good up to 45s., on the increase in the number of stamps to 55, and statements that rich ore has been met in an adjoining property. Indian mines show a general advance, led by Mysore. This mine is doubling its cyanide plant. Oregum and Mandydroog also show good advances. Broken Hill lower at 55. Last week's crashing was not so favourable, and there has been a disposition to sell till it is seen how the present week's crashing turns out. Afrikaners are at 31s. 3d.; Austin, 4s. 6d.; Associated West Australian, 41s. 3d.; African Recovery, 36s.; Anglo French, 93s. 9d.; Achilles, 3s.; African Land, 2s. 9d.; Bonanza, 53s.; Barnato Bank, 40s.; Bayley's Reward, 7s.; Balkia Eirsteling, 4s. 3d.; Bechuanaland, 43s. 9d.; Brilliant C.T., 16s.; Big Blow, 12s.; Crocod Consols, 4s.; City and Suburban, 5½; Cassel, 17s.; Coolgardie Sherlows 20s.; Colorado, 5s.; Charterland, 21s. 3d.; Central de Kaap, 2s. 3d.; Colenbranders, 18s. 9d.; Doornkop, 4s. 9d.; Eastleigh, 26s. 3d.; Geldenhuis Main, 27s.; Gold Coast Development, 3s. 9d.; Guy Fawkes, 23s. 9d.; Holcomb Valley, 1s. 9d.; Hit or Miss, 30s.; Jackson, 1s. 14d.; Kathleen, 3s.; Kapanga, 10s.; Lisbon, 7s. 9d.; La Plata, 1s. 3d.; Luipaard's, 23s. 9d.; Lindsay's, 9s.; Marchion Gold Fields, 7s.; Mashonaland Agency, 58s. 3d.; May 66s. 3d.; Mallins, 3s. 9d.; Marchion New Chums, 13s.; Nigel Deep, 50s.; Nolitsyop, 2s. 6d.; New Queen, 6s. 6d.; Oriental, 7s. 6d.; Ouro Preto, 26s.; Orient, 8s. 6d.; Otto's Kopje, 1s. 6d.; Piddington, 27s. 6d.; Rhodesia (Limited), 15s. prem.; South Londonderry, 2s. 9d.; Sutherland, 6s. 6d.; Tiger, 9s. 3d.; Tamworth, 8s. 9d. to 11s. 3d.; Waterfall Estates, 17s. 6d.; West Australian Mining, 10s.; Wealth of Nations, 32s.; Wentworth, 21s. 3d.; Wolverand, 51s. 3d.; Westleigh, 8s.; Westralia, 24s. 6d.; and West Australian Gold Concessions, 45s.

In shares of miscellaneous companies there is not much alteration to notice. Oil companies have been flat on continued competition, but show a recovery from the lowest. Broxburn touched 9½. Pampherton 6½, and Young's 24s. Killaloe Slate are at 4s. 6d., and Nobel's Explosives, 15½.

## EDINBURGH.

Messrs. THOMAS MILLER and SONS, Stock and Share Brokers, 69, Hanover-street, Edinburgh, report as follows under date of February 13:—Railway Ordinary stocks have since last weekly report continued, on the whole, to show firmness. Caledonian Deferred has risen from 56½ to 57 1.16. North British from 46½ to 46½. Great North of Scotland from 112 to 113½. Preference stocks have been in demand. In insurance shares Commercial Union, English and Scottish Law, and Guardian are somewhat higher. North British and Mercantile have declined from 40½ to 39½. British Linen Bank has risen from 39½ to 39½. Clydesdale changed from 20½ cum to 20½ ex div., Royal from 22½ to 22½. British South Africa shares have advanced from 75s. 6d. to 102s. 6d. Lothian Coal Preference have fallen from 7½ to 7. Marbellas from 51s. to 47s. 6d., Broken Hill from 60s. to 55s. 6d. Stewart and Clydesdale have risen from 10½ to 10½. In Oil shares Broxburn have changed from 10 to 10½, Dalmeny from 15½ to 14½, Linlithgow from 27s. 6d. to 25s., Pampherton from 7 to 7 1.16, Young's from 29s. 3d. to 33s. Scottish Assam Tea shares have improved from 10 5.16 to 10½.

A NEW MAP OF THE GOLD FIELDS OF WESTERN AUSTRALIA.—Maps innumerable of the promising gold fields of Western Australia have recently been issued from several sources, but we can truthfully say that none have been superior to those just published by Mr. Edward Stanford, of 26 and 27, Cockspur-street, S.W. They have been compiled and published for the West Australian Exploration Company, and are parts of a projected map of the whole colony. The size of each sheet is 34 inches by 27 inches, and as each is complete in itself, it is issued separately at the price of 4s. The size of the map when the four sheets are mounted together is 64 inches by 52 inches. These maps are quite up to date, and include the coast line from Perth to Carnarvon, extending inland 600 miles. They embrace the whole of the Marchion, Yalgoo, Yilgarn, Coolgardie, North Coolgardie, and East Coolgardie gold fields, with the northern portion of the Dundas gold field. The railways are drawn with their sanctioned and proposed extensions, all the mining centres and many of the mines are named, the dry lake beds or salt pans are shown, together with all the topographical information available at date of compilation.

"THE ENGINEER'S YEAR BOOK"—The 1896 edition of this well-known year book, compiled by Mr. H. R. Kempe, and published by Messrs. Crosby Lockwood and Son, is now published. We made known the details of this book 12 months ago, when we accorded it a very hearty reception. It would be needless, therefore, to republish the contents of the volume. All we can say is that it maintains its high standard of excellence, and in the present edition much useful matter has been incorporated. A large number of entirely new pages have been added, whilst some which are of nominal value have been rightly expunged. The new pages deal chiefly with "Breaks for the Measurement of Power," "The Bursting Strength of Tubes," "Spiral Springs," "Electrical Engineering," "Pumps," and "Mining." The mining section has been revised by that well-known expert, Mr. E. H. Davies, a gentleman who has contributed a great deal of matter to the columns of *The Mining Journal*. This engineer also contributes much valuable information on the subject of gold mining, which will be found of especial interest to our readers. The book, as usual, is well got up, and is well illustrated.

CORNWALL POLYTECHNIC SOCIETY.—The 63rd annual meeting of this well-known society was held at Falmouth this week, Mr. J. Bedford Bolitho, M.P., presiding. The annual report presented was of a very satisfactory character. The following vice-presidents were elected:—Mr. M. H. Williams, Mr. Stanhope Forbes, Mr. G. J. Barringer, F.R.S., and Mr. G. H. Fox. The observatory committee reported that the work had been efficiently carried out, and that the instruments were in good order. The other reports presented were also of a gratifying nature.



## NOTES FROM ANDALUCIA.

## PAPER ON THE CUPREOUS PYRITES DEPOSITS OF ANDALUCIA AND ALGARVE.

## RETROSPECTIVE AND PROSPECTIVE.

Extracts and Notes from Mining Operations and Reports on these during the past 25 years.

By WILLIAM GUTHRIE BOWIE.

(Continued from page 192.)

## 3. EXPLOITATION BY OVERHEAD STOPING, AND PACKING SPACES WITH STONE, &amp;c.

THIS system is now in more use than formerly, and managers and men are now well accustomed to it, and easily and economically obtain all the ore, or cupreous schist and such cupreous matters in the mine.

It is by this system that these masses can be best and most economically exploited, especially the deep mines. Even, although with some difficulty, the ores left by pillar and stall operations can be extracted by this system, and while the most perfect and economical, it is also the safest, as the works can be stopped, and even flooded. If properly carried out no harm can arise to the works, while good ventilation is available when the time comes to wash the mine for the sulphates of copper.

The hardest and most difficult ore can be easily won by this system once the first cuts are made; the weight of the masses by the slight crushing to rest on the filling in rubble always splits and shivers the solid ore into convenient blocks that facilitate the mining.

In some cases the mineral is extracted even at less cost than by open cast, and even the overburden can be shot into the deepest level's as packing, and in this way an open cast be made to extract the upper ores without any expense, as this packing is charged against the levels where used, and the ore extracted from them. A better mingling or sampling of the ore is also obtained. All useless material created in investigations or development can be packed away here, and even packing can be obtained from the walls by cross-cutting into them when necessary, without damaging the mine. It will not be necessary to enter into details of this system here, as each engineer, no doubt, would arrange his levels and shoots to answer circumstances peculiar to the mine he may manage; and it may be simply stated that the greatest success is obtained once the first cuts are made in the deepest paying portion of the mass, to divide from here up to its surface in 10 metre levels, with shoots at every 20 metres of length along the strike of the mass for ore, and intermediate ones from one level to another for the filling in stone and rubble. It is best to use stone, being in the end cheaper than earth or loose earthy rubbish. The crosscuts or slices should never be more than 2 metres wide or 2½ metres high, and so soon as a work is empty filled up without delay. If props are required they should be tapered, and the wide end put upwards so as to facilitate being drawn in the next cut—in fact, tapered steel tubes filled with timber are an improvement for this, and as all can be drawn out as cut after cut progresses, some sets of these will last the life of a mine. No pains should be spared to lay out the mine properly from the first, and sidings for wagons where they can be filled automatically from the shoots should be provided. These, and numerous other simple conveniences and plans that the progress of exploitation may suggest, will insure rapidity, economy, and safety.

Considerable economy can also be further made in this system of exploitation in explosives, fuel, and mining; and it will be observed in the list a large margin is allowed for difficulties in cases of having to employ combinations of pillar and stall and long wall stoping, &c. Those who desire to work on combinations of the systems already indicated can easily ascertain the cost by utilising the averages named whereby to multiply the tons of ore produced in each part of the mass by all or either of these systems. It has been objected that all these costs are highly estimated, but these are only supposed to be general averages, and some mines do their work for less, but there can be no errors committed in being guided by these averages, as most will find them correct in actual practice. And now what between power drills, hand-boring diamond drills, powerful explosives, and cheaper materials of every class, greater economies may be anticipated. One important feature appears to be the use of hand-boring diamond drills in the hard ore, their only drawback being the water necessary to wash up the pulp and keep the crown head cool, a thing that will be overcome in time, as the best of steel fails before the hardest ores. Some plans to collect the water from the bore are required, as this flowing in quantity through the filling in down to the levels and on the ore is very inconvenient as well as prejudicial. Everything, however, depends upon a thorough practical preparation from the very first, and if this is done, no difficulties will arise, whether the extraction is done by small wagons pushed by hand or by locomotives.

(To be continued.)

**MINERAL PRODUCTS OF CALIFORNIA.**—The California State Mining Bureau has just issued a bulletin, giving statistics of last year's mineral production in California, which shows that gold was produced in 31 of the 50 counties to the extent of \$13,923,281. Silver was mined in only 17 counties, the amount reaching \$297,331. Calaveras County produced the most gold, the amount being \$2,119,365, and San Bernardino County the largest amount of silver, the value being \$148,242. The other metals produced were in amount and value as follows:—Antimony, 150 tons, \$6000; copper, 738,594 lbs., \$72,486; iron, 200 tons, \$1500; lead, 475 tons, \$28,500; manganese, 523 tons, \$5512; platinum, 100 ounces, \$600; chrome, 3680 tons, \$79,980; quicksilver, 30,416 flasks, \$934,000. Asphaltum was produced in three counties and bituminous rock in three others, the value of both amounting to \$348,993. Natural illuminating gas worth \$75,000 was found in San Joaquin County. San Bernardino and Inyo counties produced \$807,801 worth of borax. Coal was mined in five counties to the value of 139,862 tons. Five counties yielded 783,078 barrels of petroleum, worth \$1,064,521. The structural material list includes building sandstone, concrete sandstone, marble, onyx, and slate, the total value of which reached \$2,056,026. The total aggregate value of all the minerals of the State for the 12 months is estimated at \$30,303,294.

**RUSSIAN ENGINEERING ORDERS IN BELGIUM.**—Several of the engineering firms in the Liège district of Belgium have just now some important orders in hand for Russia, this being one result of the recent activity in the formation of Russo-Belgian mining and metallurgical companies. Among the orders in hand may be stated that the Société de la Meuse is constructing the winding engine for the Prokhorov Collieries, and the colliery of the Société des Sels Gemmes, and also a pumping engine for the Gorlowka Colliery. The same company has a contract for a 700 horse power blowing engine for the Esperance blast furnaces at Toula, Russia.

**THE INTERNATIONAL TRUST AND FINANCE CORPORATION (LIMITED)** has removed from 33, Cornhill to its new premises at Pinebury House, Blomfield-street, E.C.

## RAND OUTPUT FOR JANUARY.

THE total output from the Rand district during the past month amounts to 148,178 ounces, and shows a decrease\* of 30,250 ounces, as compared with the previous month's total, and a decrease of 29,285 ounces, as compared with the corresponding month of last year. The following table gives crushings to date:—

	1891	1892	1893	1894	1895	1896
January ..	57,205 15	84,560 8	103,374	149,814	177,463	148,178
February ..	50,079 2	86,849 8	93,252	151,870	169,295	—
March .....	52,949 1	93,244 11	110,474	185,372	184,845	—
April .....	55,871 18	95,562 6	112,011	189,745	186,323	—
May .....	54,673 1	99,436 6	116,911	189,772	194,521	—
June .....	56,868 1	101,252 3	122,907	188,162	190,941	—
July .....	54,924 1	110,279 1	126,169	187,953	199,453	—
August .....	59,070 4	102,322 3	136,069	174,977	193,573	—
September ..	65,601 5½	107,851 13	129,585	174,707	194,764	—
October .....	72,793 8	112,167 8	138,599	173,378	192,552	—
November ..	73,393 15	106,794 15	138,640	175,304	195,418	—
December ..	80,312 11	170,748 17	146,357	182,101	178,428	—
	729,237 2½	1,120,868 1	1,478,473	21,024,59	2,277,755	148,178

\* Decrease due to scarcity of native labour and political situation.

**MINERAL PRODUCTS OF INDIA.**—In an introduction to his "Review of Mineral Production in India for 1894," Dr. George Watt, Reporter on Economic Products, explains the object which the Government of India had in view in ordering the compilation to be made. It is briefly that the particulars annually ascertained should be given in the form of two statements, the first comprising the more important minerals for which approximately trustworthy returns are available from year to year, and the second dealing with commercial minerals, regarding which definite particulars cannot be procured. "It is believed," writes Dr. Watt, "that an attempt to bring together annual returns under each of these sections would very possibly eliminate the defects that exist in our knowledge of the mineral wealth of the country, and thereby forcibly direct attention to this aspect of India's productive resources." The body of the work is a clear and careful grouping of facts and figures bearing upon the production and sale of coal, iron ores, and petroleum. These products belong to the first category. In the second, Dr. Watt deals with gold, diamond, jade, quartz, ruby, alum, borax, copper, lead and tin ores, &c. Exhaustive information is furnished under each of these heads. Dr. Watt regards the Review for the present as merely a "convenient tabulation of such particulars as are annually procurable," but its first volume gives promise of a valuable addition being made eventually to the economic history of India.

**A NEW MINING PAPER FOR SAN FRANCISCO.**—We have received with pleasure, and examined with interest, a copy of the first issue of a new paper that, to all appearances, enters, auspiciously enough, upon its career as an organ representing the mining interests of San Francisco and its neighborhood. The magnitude and importance to which the industry has attained in California make it imperatively necessary that it should be represented by a journal conducted with ability, reflecting the course of mining affairs in the State with completeness and accuracy, and, above all, wholly impervious to improper influences, and notwithstanding that several organs are already enjoying a vigorous and useful life in the far-famed Western State, there is still room for such a paper as *The State Mining Journal*. So far as we have been able to gather from this early issue, the journal is likely to have a long and successful career, to exert a beneficial influence by the well-judged tone of its comment, and to discharge ably the duties of a representative journalistic on industrial matters.

**A NEW EDITION OF A WELL-KNOWN MAP.**—A new and revised edition of Messrs. G. W. Bacon and Co.'s well-known map of Johannesburg and the Witwatersrand gold fields has just made its appearance, and in its general excellence reflects credit even upon the eminent firm who have produced it. The map shows, with extraordinary clearness, a most happy combination of boldness in marking and delicacy in tints, the main and subsidiary reefs, the farms, gold mining companies' claims, concessions, &c., and since it is based upon information current in the official circles as late as last month, the accuracy of the cartographic must of necessity be above suspicion. Before reappearance in its new and better form the map was subjected to thorough revision, and this edition contains a new enlarged map of all the farms from Langlaagte to Leeuwpoot and East Rand, showing the reefs, boundaries, railways, roads, and rivers. It may be mentioned that the map has an added interest at the present time from the fact that it reflects on the largest scale yet published the entire route from Krugersdorp to Doornkop and Johannesburg, the field of Dr. Jameson's encounter with the Boers.

## WANTED.

\* Prepaid Advertisements are inserted in this column at the rate of 8d. per line, with a minimum charge of 4s.

**ASSAYER and CHEMIST**, who has had several years sole charge of Works Laboratory, DESIRES to make a CHANGE. Experience in Ores, &c., of Gold, Silver, Copper, Zinc, and Lead. Excellent references and testimonials. Address, "C. A. 669," Messrs. DEACON'S, Leadenhall Street, E.C.

**ANALYSTS**, located in Lead, Zinc, Copper, and Silver Mining Districts, in any part of the world, whence ore is or might be shipped to Europe, are INVITED to communicate details and to send their CHARGES for Sampling, Assaying, &c., to "LONDON ORE BROKERS," care of MINING JOURNAL Office, 18, Finch Lane, London, E.C. Good testimonials and references indispensable. Year's buying 150,000 tons.

**FOREMAN SMELTER**, with thorough experience of TREATMENT OF SILVER ORES, Residue, &c., in water-jacketed furnaces. Apply by letter to "W.J.F.," MINING JOURNAL, 18, Finch Lane, London, E.C.

**MINING ACCOUNTANT and CASHIER.**—WANTED SITUATION abroad, age 23. Has a good knowledge of Spanish acquired in the country, also German and French. Has kept Spanish accounts. Excellent references. Address, "O.C. Co.," 32, Great St. Helens, E.C.

**MINING ENGINEER WANTED** to Develop small property in healthy district, West Africa. State full particulars, past experience. Copies of recent testimonials, and salary required, to "BRACH," care of MINING JOURNAL Office, 18, Finch Lane, London, E.C.

**ROCK DRILL OPERATORS WANTED** (several). Those used to Schram Drills preferred. Address, "ROCK DRILL," MINING JOURNAL Office, 18, Finch Lane, London, E.C.

**WINFORD GLEBE OCHRE MINE.**—£4 an acre, 2s. 6d. a ton Royalty. A company wanted it, but a higher Royalty deterred them. Address, H. TRIPP, Winford, Bristol.

## SALE BY AUCTION.

\* Advertisements are inserted in this column at the rate of 8d. per line with a minimum charge of 4s.

By Order of the Mortgagees.—Cornwall.—A valuable Freehold Agricultural and Mineral Estate of about 116 acres, known as Halwell and Quarry Parks, and two-thirds (undivided) of Waygate Parks, of about 28 acres, situate in the parishes of Linkinhorne and Northhill, between Launceston and Liskeard, and distant about seven miles from the former county town, from which there is direct communication between London and the principal manufacturing centres by the London and South-Western and Great Western Railways. It comprises a rich dairy and stock farm with capital stone-built residence and outbuildings, garden, orchard, and productive lands, nearly all in pasture; valuable ochre beds on the Halwell property, which closely underlie the surface and extend to a considerable depth, and according to borings over only about 4½ acres are estimated to yield a large income from the almost unlimited quantity of this important mineral deposit; also a quarry of fine freestone. All timber will be included. The property will be sold free from tenant-right valuations, and with the advantage of possession upon completion of the purchase.—Messrs.

**FAREBROTHER, ELLIS, CLARK, and Co.** will SELL by AUCTION, at the White Hart Hotel, Launceston, on Wednesday, February 26, 1896, at 2 for 3 o'clock precisely, in one lot, the above ESTATE, particulars of which, with conditions of sale, may be had on application to Messrs. Hubbard, Son, and Eve, Solicitors, 110, Cannon-street, London, E.C.; Messrs. Gush, Phillips, and Co., Solicitors, 3, Finsbury-circus, E.C.; Messrs. Peier and Wenn, Auctioneers, Launceston; and Messrs. Farebrother, Ellis, Clark, and Co., 29, Fleet-street, and 18, Old Broad-street, London, E.C., where a sample of the crude ochre may be seen.

## FOR SALE.

\* Prepaid Advertisements are inserted in this column at the rate of 8d. per line with a minimum charge of 4s.

## GOLD—GOLD IN NORWAY.

**A RICH GOLD FIELD** by Bömmelfjorden, near Hardanger, to be SOLD. Apply by letter, for further particulars to, CHORBJØRN, Wagge, Saranger.

## NANTLE SLATE QUARRIES.

**TO BE SOLD**, a FARM of 53 acres, with SLATE QUARRIES opened thereunder, and through which ran the best slate veins in the valley. Apply, PUGH-JONES, Ynygair, Criccieth, North Wales.

## SHIPPING.

## CASTLE LINE.—CAPE &amp; NATAL MAILS.

**WEEKLY SERVICE FOR THE GOLD FIELDS OF SOUTH AFRICA.**—The CASTLE COMPANY'S STEAMERS leave LONDON (East India Dock Basin, Blackwall) every FRIDAY, and sail from SOUTHAMPTON every SATURDAY.

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† Guelph (to S.W.) ...	Feb. 23	Feb. 23	Feb. 29	Mar. 7
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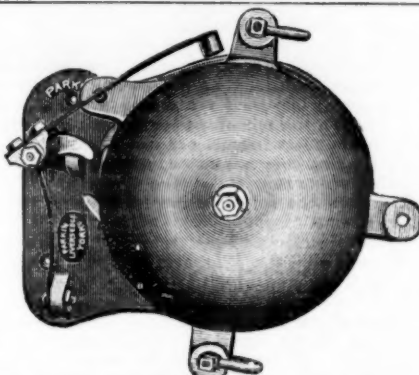
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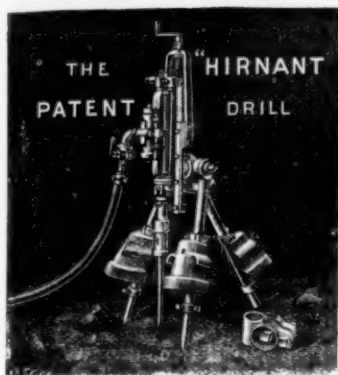
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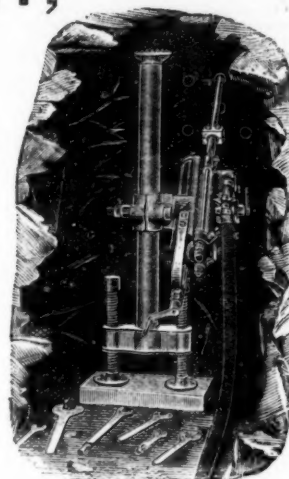
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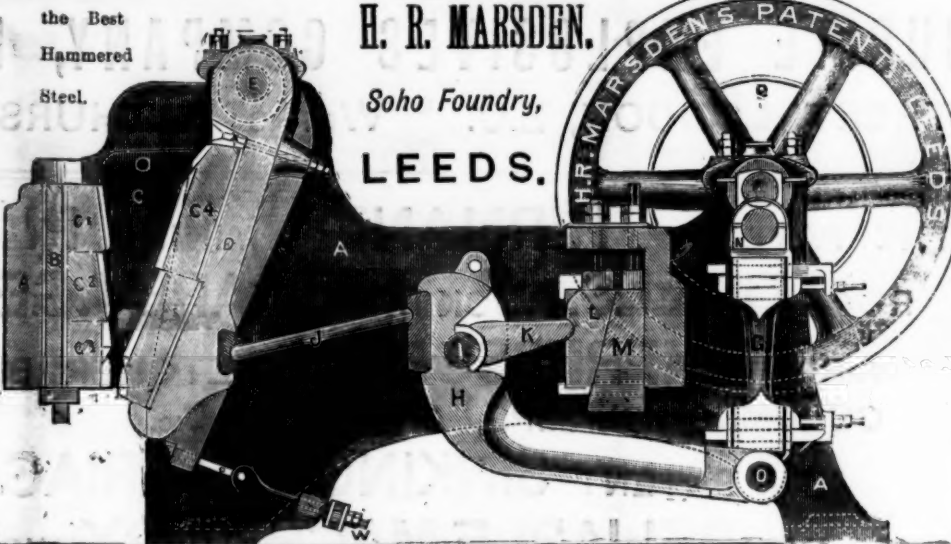
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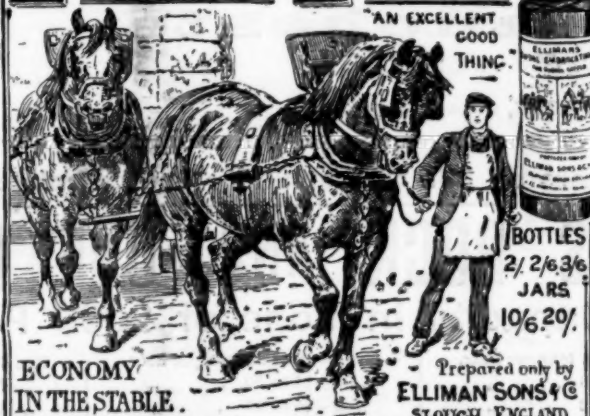
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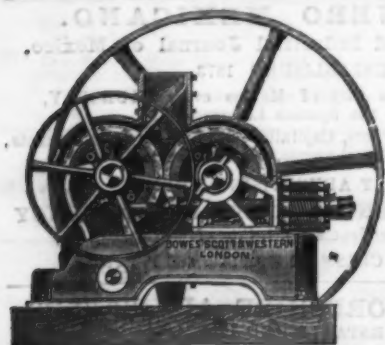
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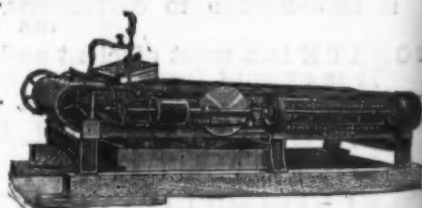
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